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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-154931-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
9/7/2021 3:20:44 PM

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Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154931-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-154931-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-154931-1

Comments
No additional comments.

Receipt
The samples were received on 8/21/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 1.1º C and 1.2º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154931-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154931-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-154931-1	TRIP BLANK_120	Water	08/18/21 00:00	08/21/21 08:00
240-154931-2	MW-82D_081821	Water	08/18/21 11:01	08/21/21 08:00
240-154931-3	MW-82SR_081821	Water	08/18/21 12:06	08/21/21 08:00
240-154931-4	MW-133S_081821	Water	08/18/21 14:11	08/21/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154931-1

Client Sample ID: TRIP BLANK_120 — Lab Sample ID: 240-154931-1

No Detections.

Client Sample ID: MW-82D_081821 — Lab Sample ID: 240-154931-2

No Detections.

Client Sample ID: MW-82SR_081821 — Lab Sample ID: 240-154931-3

No Detections.

Client Sample ID: MW-133S_081821 — Lab Sample ID: 240-154931-4

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154931-1

Client Sample ID: TRIP BLANK_120
Date Collected: 08/18/21 00:00
Date Received: 08/21/21 08:00

Lab Sample ID: 240-154931-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/24/21 17:59	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/24/21 17:59	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 17:59	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/24/21 17:59	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 17:59	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/24/21 17:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*62 - 137*		*08/24/21 17:59*	*1*
4-Bromofluorobenzene (Surr)	*92*		*56 - 136*		*08/24/21 17:59*	*1*
Toluene-d8 (Surr)	*94*		*78 - 122*		*08/24/21 17:59*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*08/24/21 17:59*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154931-1

Client Sample ID: MW-82D_081821
Date Collected: 08/18/21 11:01
Date Received: 08/21/21 08:00

Lab Sample ID: 240-154931-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/30/21 23:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*66 - 120*		*08/30/21 23:33*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/24/21 18:47	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/24/21 18:47	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 18:47	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/24/21 18:47	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 18:47	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/24/21 18:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*62 - 137*		*08/24/21 18:47*	*1*
4-Bromofluorobenzene (Surr)	*97*		*56 - 136*		*08/24/21 18:47*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*08/24/21 18:47*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*08/24/21 18:47*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154931-1

Client Sample ID: MW-82SR_081821
Date Collected: 08/18/21 12:06
Date Received: 08/21/21 08:00

Lab Sample ID: 240-154931-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/30/21 23:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*		*08/30/21 23:57*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/24/21 19:58	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/24/21 19:58	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 19:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/24/21 19:58	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 19:58	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/24/21 19:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*08/24/21 19:58*	*1*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*		*08/24/21 19:58*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*08/24/21 19:58*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*08/24/21 19:58*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154931-1

Client Sample ID: MW-133S_081821
Date Collected: 08/18/21 14:11
Date Received: 08/21/21 08:00

Lab Sample ID: 240-154931-4
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/31/21 00:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*66 - 120*		*08/31/21 00:21*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/24/21 20:21	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/24/21 20:21	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 20:21	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/24/21 20:21	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 20:21	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/24/21 20:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*62 - 137*		*08/24/21 20:21*	*1*
4-Bromofluorobenzene (Surr)	*92*		*56 - 136*		*08/24/21 20:21*	*1*
Toluene-d8 (Surr)	*92*		*78 - 122*		*08/24/21 20:21*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*08/24/21 20:21*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154931-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-154771-F-24 MS	Matrix Spike	85	92	94	86
240-154771-H-24 MSD	Matrix Spike Duplicate	87	92	95	88
240-154931-1	TRIP BLANK_120	91	92	94	95
240-154931-2	MW-82D_081821	97	97	95	98
240-154931-3	MW-82SR_081821	93	94	95	94
240-154931-4	MW-133S_081821	95	92	92	96
LCS 240-500803/5	Lab Control Sample	90	97	98	91
MB 240-500803/7	Method Blank	100	97	96	97

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-154931-2	MW-82D_081821	88
240-154931-3	MW-82SR_081821	87
240-154931-4	MW-133S_081821	91
240-155009-K-2 MS	Matrix Spike	88
240-155009-M-2 MSD	Matrix Spike Duplicate	91
LCS 240-501712/3	Lab Control Sample	84
MB 240-501712/5	Method Blank	89

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-500803/7
Matrix: Water
Analysis Batch: 500803

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/24/21 12:53	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/24/21 12:53	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 12:53	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/24/21 12:53	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 12:53	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/24/21 12:53	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*		*08/24/21 12:53*	*1*
4-Bromofluorobenzene (Surr)	*97*		*56 - 136*		*08/24/21 12:53*	*1*
Toluene-d8 (Surr)	*96*		*78 - 122*		*08/24/21 12:53*	*1*
Dibromofluoromethane (Surr)	*97*		*73 - 120*		*08/24/21 12:53*	*1*

Lab Sample ID: LCS 240-500803/5
Matrix: Water
Analysis Batch: 500803

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	24.9		ug/L		99	63 - 134
cis-1,2-Dichloroethene	25.0	24.2		ug/L		97	77 - 123
Tetrachloroethene	25.0	24.3		ug/L		97	76 - 123
trans-1,2-Dichloroethene	25.0	24.4		ug/L		97	75 - 124
Trichloroethene	25.0	24.9		ug/L		100	70 - 122
Vinyl chloride	25.0	21.3		ug/L		85	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*97*		*56 - 136*
Toluene-d8 (Surr)	*98*		*78 - 122*
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Lab Sample ID: 240-154771-F-24 MS
Matrix: Water
Analysis Batch: 500803

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	25.0	23.4		ug/L		94	56 - 135
cis-1,2-Dichloroethene	1.0	U	25.0	22.9		ug/L		92	66 - 128
Tetrachloroethene	1.0	U	25.0	21.7		ug/L		87	62 - 131
trans-1,2-Dichloroethene	1.0	U	25.0	22.8		ug/L		91	56 - 136
Trichloroethene	1.0	U	25.0	23.6		ug/L		95	61 - 124
Vinyl chloride	1.0	U	25.0	20.0		ug/L		80	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*62 - 137*
4-Bromofluorobenzene (Surr)	*92*		*56 - 136*
Toluene-d8 (Surr)	*94*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-154771-F-24 MS
Matrix: Water
Analysis Batch: 500803

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	86		73 - 120

Lab Sample ID: 240-154771-H-24 MSD
Matrix: Water
Analysis Batch: 500803

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	25.0	24.3		ug/L		97	56 - 135	4	26
cis-1,2-Dichloroethene	1.0	U	25.0	23.8		ug/L		95	66 - 128	4	14
Tetrachloroethene	1.0	U	25.0	22.3		ug/L		89	62 - 131	3	20
trans-1,2-Dichloroethene	1.0	U	25.0	23.6		ug/L		95	56 - 136	4	15
Trichloroethene	1.0	U	25.0	23.3		ug/L		93	61 - 124	1	15
Vinyl chloride	1.0	U	25.0	20.5		ug/L		82	43 - 157	2	24

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	87		62 - 137
4-Bromofluorobenzene (Surr)	92		56 - 136
Toluene-d8 (Surr)	95		78 - 122
Dibromofluoromethane (Surr)	88		73 - 120

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-501712/5
Matrix: Water
Analysis Batch: 501712

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/30/21 21:04	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	89		66 - 120		08/30/21 21:04	1

Lab Sample ID: LCS 240-501712/3
Matrix: Water
Analysis Batch: 501712

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.59		ug/L		96	80 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	84		66 - 120

Lab Sample ID: 240-155009-K-2 MS
Matrix: Water
Analysis Batch: 501712

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	9.23		ug/L		92	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*88*		*66 - 120*

Lab Sample ID: 240-155009-M-2 MSD
Matrix: Water
Analysis Batch: 501712

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.47		ug/L		95	51 - 153	3	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*91*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154931-1

GC/MS VOA

Analysis Batch: 500803

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154931-1	TRIP BLANK_120	Total/NA	Water	8260B	
240-154931-2	MW-82D_081821	Total/NA	Water	8260B	
240-154931-3	MW-82SR_081821	Total/NA	Water	8260B	
240-154931-4	MW-133S_081821	Total/NA	Water	8260B	
MB 240-500803/7	Method Blank	Total/NA	Water	8260B	
LCS 240-500803/5	Lab Control Sample	Total/NA	Water	8260B	
240-154771-F-24 MS	Matrix Spike	Total/NA	Water	8260B	
240-154771-H-24 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 501712

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154931-2	MW-82D_081821	Total/NA	Water	8260B SIM	
240-154931-3	MW-82SR_081821	Total/NA	Water	8260B SIM	
240-154931-4	MW-133S_081821	Total/NA	Water	8260B SIM	
MB 240-501712/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-501712/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-155009-K-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-155009-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154931-1

Client Sample ID: TRIP BLANK_120

Lab Sample ID: 240-154931-1
Matrix: Water
Date Collected: 08/18/21 00:00
Date Received: 08/21/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	500803	08/24/21 17:59	SAM	TAL CAN

Client Sample ID: MW-82D_081821

Lab Sample ID: 240-154931-2
Matrix: Water
Date Collected: 08/18/21 11:01
Date Received: 08/21/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	500803	08/24/21 18:47	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	501712	08/30/21 23:33	CS	TAL CAN

Client Sample ID: MW-82SR_081821

Lab Sample ID: 240-154931-3
Matrix: Water
Date Collected: 08/18/21 12:06
Date Received: 08/21/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	500803	08/24/21 19:58	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	501712	08/30/21 23:57	CS	TAL CAN

Client Sample ID: MW-133S_081821

Lab Sample ID: 240-154931-4
Matrix: Water
Date Collected: 08/18/21 14:11
Date Received: 08/21/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	500803	08/24/21 20:21	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	501712	08/31/21 00:21	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154931-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

MICHIGAN 190

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact

pany Name: Arcadis

ress: 28550 Cabot Drive, Suite 500

State/Zip: Novi, MI, 48377

e: 248-994-2240

ect Name: Ford LTP Off-Site

ect Number: 30080642.402.04

30080642.402.04

Client Project Manager: Kris Hinskey

Telephone: 248-994-2240

Email: kristoffer.hinskey@arcadis.com

Sampler Name: Gary Schafer

Method of Shipment/Carrier:

Shipping/Tracking No:

Site Contact: Julia McClafferty

Telephone: 734-644-5131

Lab Contact: Mike DelMonico

Telephone: 330-497-9396

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below

10 day — 3 weeks / 2 weeks / 1 week / 2 days / 1 day

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y/N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 120	---	---		X						1							X	X	X	X	X	X	X	1 Trip Blank
MW-82D_081821	08/18/21	1101		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-82SR_081821	08/18/21	1206		X						6					N	G	X	X	X	X	X	X	X	
MW-133S_081821	08/18/21	1411		X						6					N	G	X	X	X	X	X	X	X	

240-154931 Chain of Custody

ossible Hazard Identification

Non-Hazard Flammable kin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

Return to Client Disposal By Lab Archive For Months

cial Instructions/QC Requirements & Comments:

mit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631

el IV Reporting requested.

	Company	Date/Time	Received by	Company	Date/Time
nquished by: Gary Schafer	Arcadis	08/19/21 1532	Nov cold storage	Arcadis	08/19/21 1532
nquished by: [signature]	Arcadis	8/20/21 949	[signature]	ETA	8/20/21 949
nquished by: [signature]	ETA	8/20/21 1454	Received in Laboratory by: [signature]	ETA	8/21/21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login #** 154931
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by Trent

Cooler Received on 8/21/21 Opened on 8/21/21

FedEx 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours Drop-off Date/Time Storage Location

TestAmerica Cooler # 7A Foam Box Client Cooler Box Other _____

Packing material used Bubble Wrap Foam Plastic Bag None Other _____

COOLANT Wet Ice Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt ☑ See Multiple Cooler Form

IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp _____°C Corrected Cooler Temp _____°C

IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp _____°C Corrected Cooler Temp _____°C

2 Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3 Shippers' packing slip attached to the cooler(s)?	Yes	No
4 Did custody papers accompany the sample(s)?	Yes	No
5 Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6 Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7 Did all bottles arrive in good condition (Unbroken)?	Yes	No
8 Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9 For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10 Were correct bottle(s) used for the test(s) indicated? 8.25.21	Yes	No
11 Sufficient quantity received to perform indicated analyses?	Yes	No
12 Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory		
13 Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC157842
14 Were VOAs on the COC?	Yes	No
15 Were air bubbles >6 mm in any VOA vials? ● ← Larger than this	Yes	No NA
16 Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # Covered	Yes	No
17 Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving.

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by Me

The TB is not logged for SIM per PM.

19 SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired

Sample(s) _____ were received in a broken container

Sample(s) _____ were received with bubble >6 mm in diameter (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory

Time preserved _____ Preservative(s) added/Lot number(s) _____

VOA Sample Preservation - Date/Time VOAs Frozen _____

WI-NC-099

Login # : 154931

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form

Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
(TA) Client Box Other	~~IR-11~~ IR-12	1.0	1.1	(Wet Ice) Blue Ice Dry Ice Water None
(TA) Client Box Other	~~IR-11~~ IR-12	1.1	1.2	(Wet Ice) Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice

DATA VERIFICATION REPORT

September 07, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04_W01 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 154931-1
Sample date: 2021-08-18
Report received by CADENA: 2021-09-07
Initial Data Verification completed by CADENA: 2021-09-07
Number of Samples:4
Sample Matrices: Water and trip blank
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 154931-1

		Sample Name:	TRIP BLANK_120				MW-82D_081821				MW-82SR_081821				MW-133S_081821			
		Lab Sample ID:	2401549311				2401549312				2401549313				2401549314			
		Sample Date:	8/18/2021				8/18/2021				8/18/2021				8/18/2021			
	Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC																		
	OSW-8260B																	
	1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	OSW-8260BBSim																	
	1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

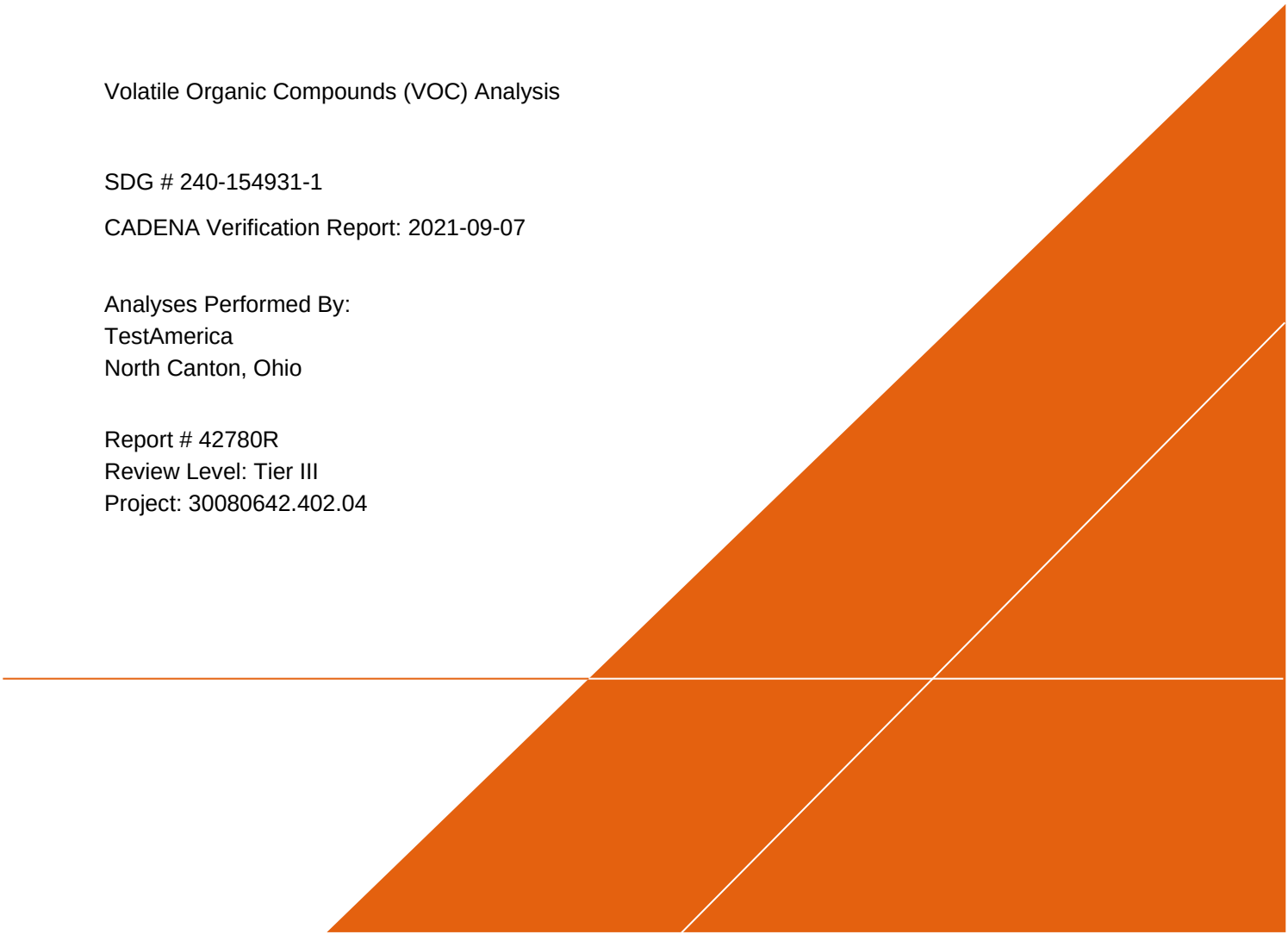
Volatile Organic Compounds (VOC) Analysis

SDG # 240-154931-1

CADENA Verification Report: 2021-09-07

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 42780R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-154931-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_120	240-154931-1	Water	08/18/21		X	
MW-82D_081821	240-154931-2	Water	08/18/21		X	X
MW-82SR_081821	240-154931-3	Water	08/18/21		X	X
MW-133S_081821	240-154931-4	Water	08/18/21		X	X

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.
  - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
  - E The compound was quantitated above the calibration range.
  - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
  - J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
  - UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
  - J+ The result is an estimated quantity, but the result may be biased high.
  - J- The result is an estimated quantity, but the result may be biased low.
  - UB Analyte considered non-detect at the listed value due to associated blank contamination.
  - N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
  - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

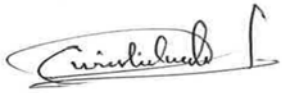
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: September 29, 2021

PEER REVIEW: Andrew Korycinski

DATE: September 29, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact

pany Name: Arcadis

ress: 28550 Cabot Drive, Suite 500

State/Zip: Novi, MI, 48377

e: 248-994-2240

ect Name: Ford LTP Off-Site

ect Number: 30080642.402.04

30080642.402.04

Client Project Manager: Kris Hinskey

Telephone: 248-994-2240

Email: kristoffer.hinskey@arcadis.com

Sampler Name: Gary Schafer

Method of Shipment/Carrier:

Shipping/Tracking No:

Site Contact: Julia McClafferty

Telephone: 734-644-5131

Lab Contact: Mike DelMonico

Telephone: 330-497-9396

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below

10 day ☑ 3 weeks 2 weeks ☐ 1 week 2 days 1 day

Analyses

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1 1-DCE 8260B	cis-1 2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
✓TRIP BLANK_ 120	---	---		X						1							X	X	X	X	X	X	X	1 Trip Blank
✓MW-82D_081821	08/18/21	1101		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
✓MW-82SR_081821	08/18/21	1206		X						6					N	G	X	X	X	X	X	X	X	
✓MW-133S_081821	08/18/21	1411		X						6					N	G	X	X	X	X	X	X	X	

240-154931 Chain of Custody

ossible Hazard Identification

☑ Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

Return to Client ☑ Disposal By Lab Archive For Months

cial Instructions/QC Requirements & Comments:

mit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631

el IV Reporting requested.

nquished by: Gary Schafer	Company: Arcadis	Date/Time: 08/19/21 1532	Received by: Nov cold storage	Company: Arcadis	Date/Time: 08/19/21 1532
nquished by: [signature]	Company: Arcadis	Date/Time: 8/20/21 949	Received by: [signature]	Company: ETA	Date/Time: 8/20/21 949
nquished by: [signature]	Company: ETA	Date/Time: 8/20/21 1454	Received in Laboratory by: [signature]	Company: ETA	Date/Time: 8/21/21 800

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Client Sample ID: TRIP BLANK_120
Lab Sample ID: 240-154931-1
Date Collected: 08/18/21 00:00
Matrix: Water
Date Received: 08/21/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/24/21 17:59	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/24/21 17:59	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 17:59	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/24/21 17:59	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 17:59	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/24/21 17:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*62 - 137*		*08/24/21 17:59*	*1*
4-Bromofluorobenzene (Surr)	*92*		*56 - 136*		*08/24/21 17:59*	*1*
Toluene-d8 (Surr)	*94*		*78 - 122*		*08/24/21 17:59*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*08/24/21 17:59*	*1*

Client Sample ID: MW-82D_081821
Lab Sample ID: 240-154931-2
Date Collected: 08/18/21 11:01
Matrix: Water
Date Received: 08/21/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/30/21 23:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*66 - 120*		*08/30/21 23:33*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/24/21 18:47	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/24/21 18:47	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 18:47	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/24/21 18:47	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 18:47	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/24/21 18:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*62 - 137*		*08/24/21 18:47*	*1*
4-Bromofluorobenzene (Surr)	*97*		*56 - 136*		*08/24/21 18:47*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*08/24/21 18:47*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*08/24/21 18:47*	*1*

Client Sample ID: MW-82SR_081821
Lab Sample ID: 240-154931-3
Date Collected: 08/18/21 12:06
Matrix: Water
Date Received: 08/21/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/30/21 23:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*		*08/30/21 23:57*	*1*

Client Sample ID: MW-82SR_081821
Lab Sample ID: 240-154931-3
Date Collected: 08/18/21 12:06
Matrix: Water
Date Received: 08/21/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/24/21 19:58	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/24/21 19:58	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 19:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/24/21 19:58	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 19:58	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/24/21 19:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*08/24/21 19:58*	*1*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*		*08/24/21 19:58*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*08/24/21 19:58*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*08/24/21 19:58*	*1*

Client Sample ID: MW-133S_081821
Lab Sample ID: 240-154931-4
Date Collected: 08/18/21 14:11
Matrix: Water
Date Received: 08/21/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/31/21 00:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*66 - 120*		*08/31/21 00:21*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/24/21 20:21	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/24/21 20:21	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 20:21	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/24/21 20:21	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 20:21	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/24/21 20:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*62 - 137*		*08/24/21 20:21*	*1*
4-Bromofluorobenzene (Surr)	*92*		*56 - 136*		*08/24/21 20:21*	*1*
Toluene-d8 (Surr)	*92*		*78 - 122*		*08/24/21 20:21*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*08/24/21 20:21*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-154635-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
8/31/2021 10:02:08 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154635-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154635-1

Job ID: 240-154635-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-154635-1

Comments
No additional comments.

Receipt
The samples were received on 8/17/2021 10:40 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 4.2º C and 4.7º C.

GC/MS VOA
Method 8260B: There was an MS/MSD analyzed in batch 240-500017 but could not be reported because the associated sample needed reanalyzed in a different batch: TRIP BLANK_95 (240-154635-1) and MW-83_081321 (240-154635-2).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154635-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154635-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-154635-1	TRIP BLANK_95	Water	08/13/21 00:00	08/17/21 10:40
240-154635-2	MW-83_081321	Water	08/13/21 11:50	08/17/21 10:40

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154635-1

Client Sample ID: TRIP BLANK_95 — Lab Sample ID: 240-154635-1

No Detections.

Client Sample ID: MW-83_081321 — Lab Sample ID: 240-154635-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154635-1

Client Sample ID: TRIP BLANK_95
Date Collected: 08/13/21 00:00
Date Received: 08/17/21 10:40

Lab Sample ID: 240-154635-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/18/21 21:16	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/18/21 21:16	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/18/21 21:16	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/18/21 21:16	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/18/21 21:16	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/18/21 21:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*		*08/18/21 21:16*	*1*
4-Bromofluorobenzene (Surr)	*115*		*56 - 136*		*08/18/21 21:16*	*1*
Toluene-d8 (Surr)	*99*		*78 - 122*		*08/18/21 21:16*	*1*
Dibromofluoromethane (Surr)	*93*		*73 - 120*		*08/18/21 21:16*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154635-1

Client Sample ID: MW-83_081321
Date Collected: 08/13/21 11:50
Date Received: 08/17/21 10:40

Lab Sample ID: 240-154635-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/21/21 05:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*		*08/21/21 05:59*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/18/21 21:40	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/18/21 21:40	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/18/21 21:40	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/18/21 21:40	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/18/21 21:40	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/18/21 21:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*62 - 137*		*08/18/21 21:40*	*1*
4-Bromofluorobenzene (Surr)	*118*		*56 - 136*		*08/18/21 21:40*	*1*
Toluene-d8 (Surr)	*102*		*78 - 122*		*08/18/21 21:40*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*08/18/21 21:40*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154635-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-154635-1	TRIP BLANK_95	86	115	99	93
240-154635-2	MW-83_081321	87	118	102	96
LCS 240-500017/4	Lab Control Sample	85	116	100	97
MB 240-500017/7	Method Blank	82	114	101	91

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-154635-2	MW-83_081321	81
240-154644-L-3 MS	Matrix Spike	84
240-154644-Q-3 MSD	Matrix Spike Duplicate	87
LCS 240-500493/3	Lab Control Sample	85
MB 240-500493/4	Method Blank	85

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-500017/7
Matrix: Water
Analysis Batch: 500017

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/18/21 16:31	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/18/21 16:31	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/18/21 16:31	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/18/21 16:31	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/18/21 16:31	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/18/21 16:31	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*62 - 137*		*08/18/21 16:31*	*1*
4-Bromofluorobenzene (Surr)	*114*		*56 - 136*		*08/18/21 16:31*	*1*
Toluene-d8 (Surr)	*101*		*78 - 122*		*08/18/21 16:31*	*1*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*08/18/21 16:31*	*1*

Lab Sample ID: LCS 240-500017/4
Matrix: Water
Analysis Batch: 500017

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.69		ug/L		97	63 - 134
cis-1,2-Dichloroethene	10.0	9.72		ug/L		97	77 - 123
Tetrachloroethene	10.0	9.24		ug/L		92	76 - 123
trans-1,2-Dichloroethene	10.0	9.81		ug/L		98	75 - 124
Trichloroethene	10.0	9.42		ug/L		94	70 - 122
Vinyl chloride	10.0	10.8		ug/L		108	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*62 - 137*
4-Bromofluorobenzene (Surr)	*116*		*56 - 136*
Toluene-d8 (Surr)	*100*		*78 - 122*
Dibromofluoromethane (Surr)	*97*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-500493/4
Matrix: Water
Analysis Batch: 500493

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/20/21 22:07	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*08/20/21 22:07*	*1*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-500493/3
Matrix: Water
Analysis Batch: 500493

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.2		ug/L		102	80 - 122		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

Lab Sample ID: 240-154644-L-3 MS
Matrix: Water
Analysis Batch: 500493

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	9.72		ug/L		97	51 - 153		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*

Lab Sample ID: 240-154644-Q-3 MSD
Matrix: Water
Analysis Batch: 500493

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.0		ug/L		100	51 - 153	3	16

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154635-1

GC/MS VOA

Analysis Batch: 500017

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154635-1	TRIP BLANK_95	Total/NA	Water	8260B	
240-154635-2	MW-83_081321	Total/NA	Water	8260B	
MB 240-500017/7	Method Blank	Total/NA	Water	8260B	
LCS 240-500017/4	Lab Control Sample	Total/NA	Water	8260B	

Analysis Batch: 500493

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154635-2	MW-83_081321	Total/NA	Water	8260B SIM	
MB 240-500493/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-500493/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-154644-L-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-154644-Q-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154635-1

Client Sample ID: TRIP BLANK_95

Lab Sample ID: 240-154635-1

Date Collected: 08/13/21 00:00

Matrix: Water

Date Received: 08/17/21 10:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	500017	08/18/21 21:16	LRW	TAL CAN

Client Sample ID: MW-83_081321

Lab Sample ID: 240-154635-2

Date Collected: 08/13/21 11:50

Matrix: Water

Date Received: 08/17/21 10:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	500017	08/18/21 21:40	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	500493	08/21/21 05:59	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154635-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

MICHIGAN 190

TestAmerica

TestAmerica Laboratory location Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Seth Turner		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30080642.402.04	Shipping/Tracking No:		
PO # 30080642.402.04			

Analysis Turnaround Time: TAT if different from below — 10 day; 3 weeks; ✓ 2 weeks; 1 week; days; 1 day

COC No: 1 of 1 COCs

For lab use only: Walk-in client; Lab sampling; Job/SDG No:

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions.
✓ TRIP BLANK_ 95				X						1							X	X	X	X	X	X	X	1 Trip Blank
✓ MW 83.081221	8/13/21	1150		X						6					NG		X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-154635 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; ✓ Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
Seth Turner	Arcadis	8/13/21 1400	Now cold storage	Arcadis	8/13/21 1400
Elizabeth Spencer	Arcadis	8/16/21 954	Amanda Battaglia	ETA	8/16/21 954
Amanda Battaglia	ETA	8/16/21 1418	Received in Laboratory by: [illegible]	ETA	8-17-21 1040

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login #** 154635
Canton Facility

Client Arcadis Site Name

Cooler unpacked by Justin H

Cooler Received on 8-17-21 Opened on 8-17-21

FedEx 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used Bubble Wrap *Foam* Plastic Bag *None* Other

COOLANT Wet Ice Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt ☒ See Multiple Cooler Form

IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp ____°C Corrected Cooler Temp ____°C

IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp ____°C Corrected Cooler Temp ____°C

2	Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
	-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
	-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
	-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3	Shippers' packing slip attached to the cooler(s)?	Yes	No
4	Did custody papers accompany the sample(s)?	Yes	No
5	Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6	Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7	Did all bottles arrive in good condition (Unbroken)?	Yes	No
8	Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9	For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N) and sample type of grab/comp (Y/N)?		
10	Were correct bottle(s) used for the test(s) indicated? 8/18/21	Yes	No
11	Sufficient quantity received to perform indicated analyses?	Yes	No
12	Are these work share samples and all listed on the COC?	Yes	No
	If yes, Questions 13-17 have been checked at the originating laboratory		
13	Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC157842
14	Were VOAs on the COC?	Yes	No
15	Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	No NA
16	Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # covered	Yes	No
17	Was a LL Hg or Me Hg trip blank present? ____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by

TB not to be analyzed for 8260-Sim

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired

Sample(s) ____ were received in a broken container

Sample(s) ____ were received with bubble >6 mm in diameter (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory

Time preserved ____ Preservative(s) added/Lot number(s) ____

VOA Sample Preservation - Date/Time VOAs Frozen ____

WI-NC-099

Login # : 154635

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form				
Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
(TA) Client Box Other	(R-1) IR-12	4.1	4.2	(Wet Ice) Blue Ice Dry Ice Water None
(TA) Client Box Other	(IR-1) IR 12	4.6"	4.7	(Wet Ice) Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR 11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR 11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
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TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR 11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
☐ See Temperature Excursion Form				

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 240-154635-1

Login Number: 154635
List Number: 1
Creator: Rigdon, Jessica M

List Source: Eurofins TestAmerica, Canton

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.		
The cooler's custody seal, if present, is intact.		
Sample custody seals, if present, are intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the containers received and the COC.		
Samples are received within Holding Time (excluding tests with immediate HTs)		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified.		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Residual Chlorine Checked.		

DATA VERIFICATION REPORT

August 31, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04_W01 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 154635-1
Sample date: 2021-08-13
Report received by CADENA: 2021-08-31
Initial Data Verification completed by CADENA: 2021-08-31
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch MS/MSD issues as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 154635-1

		Sample Name:	TRIP BLANK_95				MW-83_081321			
		Lab Sample ID:	2401546351				2401546352			
		Sample Date:	8/13/2021				8/13/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

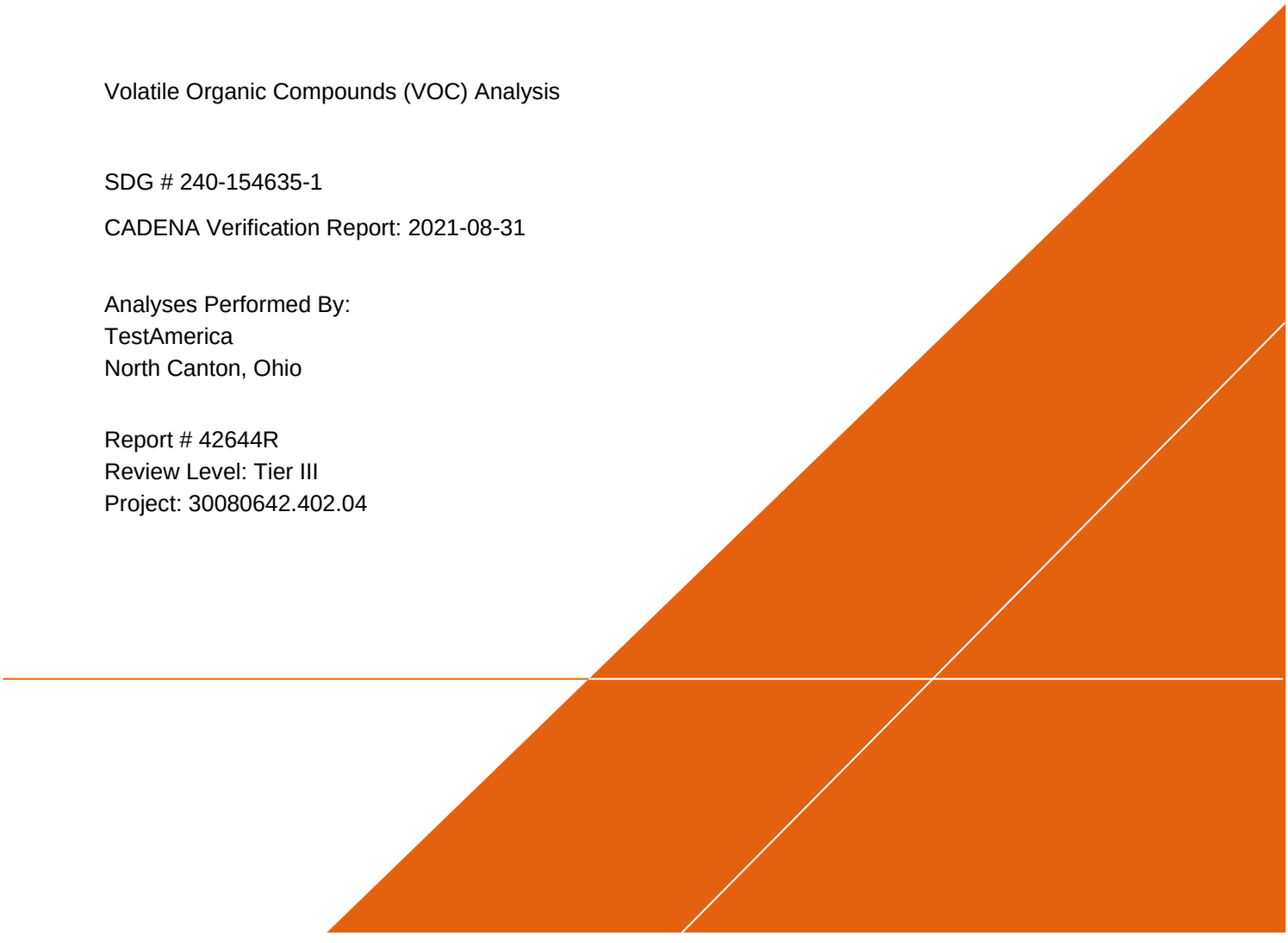
Volatile Organic Compounds (VOC) Analysis

SDG # 240-154635-1

CADENA Verification Report: 2021-08-31

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 42644R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-154635-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_95	240-154635-1	Water	08/13/21		X	
MW-83_081321	240-154635-2	Water	08/13/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

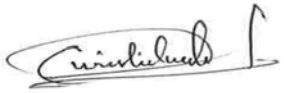
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: September 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: September 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190

TestAmerica

TestAmerica Laboratory location Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Seth Turner	TAT if different from below: 10 day (✓) 2 weeks; 3 weeks; 1 week; days; 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Ureprs	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions.
TRIP BLANK_95				X						1							X	X	X	X	X	X	X	1 Trip Blank
MW 83_0812'21	8/13/21	1150		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-154635 Chain of Custody

Possible Hazard Identification
(✓) Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Return to Client; (✓) Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
Seth Turner	Arcadis	8/13/21 1400	Now cold storage	Arcadis	8/13/21 1400
Elizabeth Gibson	Arcadis	8/16/21 954	Edward Butler	ETA	8/16/21 954
Edward Butler	ETA	8/16/21 1418	Received in Laboratory by: EH	ETA	8-17-21 1040

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Client Sample ID: TRIP BLANK_95
Lab Sample ID: 240-154635-1
Date Collected: 08/13/21 00:00
Matrix: Water
Date Received: 08/17/21 10:40

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/18/21 21:16	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/18/21 21:16	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/18/21 21:16	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/18/21 21:16	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/18/21 21:16	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/18/21 21:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*		*08/18/21 21:16*	*1*
4-Bromofluorobenzene (Surr)	*115*		*56 - 136*		*08/18/21 21:16*	*1*
Toluene-d8 (Surr)	*99*		*78 - 122*		*08/18/21 21:16*	*1*
Dibromofluoromethane (Surr)	*93*		*73 - 120*		*08/18/21 21:16*	*1*

Client Sample ID: MW-83_081321
Lab Sample ID: 240-154635-2
Date Collected: 08/13/21 11:50
Matrix: Water
Date Received: 08/17/21 10:40

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/21/21 05:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*		*08/21/21 05:59*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/18/21 21:40	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/18/21 21:40	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/18/21 21:40	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/18/21 21:40	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/18/21 21:40	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/18/21 21:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*62 - 137*		*08/18/21 21:40*	*1*
4-Bromofluorobenzene (Surr)	*118*		*56 - 136*		*08/18/21 21:40*	*1*
Toluene-d8 (Surr)	*102*		*78 - 122*		*08/18/21 21:40*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*08/18/21 21:40*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-154634-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
8/31/2021 10:01:36 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154634-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154634-1

Job ID: 240-154634-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-154634-1

Comments
No additional comments.

Receipt
The samples were received on 8/17/2021 10:40 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 4.2º C and 4.7º C.

GC/MS VOA
Method 8260B: There was an MS/MSD analyzed in batch 240-500017 but could not be reported because the associated sample needed reanalyzed in a different batch: TRIP BLANK_96 (240-154634-1) and MW-83S_081321 (240-154634-2).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154634-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154634-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-154634-1	TRIP BLANK_96	Water	08/13/21 00:00	08/17/21 10:40
240-154634-2	MW-83S_081321	Water	08/13/21 10:55	08/17/21 10:40

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154634-1

Client Sample ID: TRIP BLANK_96 — Lab Sample ID: 240-154634-1

No Detections.

Client Sample ID: MW-83S_081321 — Lab Sample ID: 240-154634-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154634-1

Client Sample ID: TRIP BLANK_96

Date Collected: 08/13/21 00:00
Date Received: 08/17/21 10:40

Lab Sample ID: 240-154634-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/18/21 20:28	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/18/21 20:28	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/18/21 20:28	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/18/21 20:28	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/18/21 20:28	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/18/21 20:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*		*08/18/21 20:28*	*1*
4-Bromofluorobenzene (Surr)	*115*		*56 - 136*		*08/18/21 20:28*	*1*
Toluene-d8 (Surr)	*100*		*78 - 122*		*08/18/21 20:28*	*1*
Dibromofluoromethane (Surr)	*93*		*73 - 120*		*08/18/21 20:28*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154634-1

Client Sample ID: MW-83S_081321
Date Collected: 08/13/21 10:55
Date Received: 08/17/21 10:40

Lab Sample ID: 240-154634-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/21/21 05:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*08/21/21 05:34*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/18/21 20:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/18/21 20:52	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/18/21 20:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/18/21 20:52	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/18/21 20:52	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/18/21 20:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*62 - 137*		*08/18/21 20:52*	*1*
4-Bromofluorobenzene (Surr)	*114*		*56 - 136*		*08/18/21 20:52*	*1*
Toluene-d8 (Surr)	*100*		*78 - 122*		*08/18/21 20:52*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*08/18/21 20:52*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154634-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-154634-1	TRIP BLANK_96	86	115	100	93
240-154634-2	MW-83S_081321	84	114	100	92
LCS 240-500017/4	Lab Control Sample	85	116	100	97
MB 240-500017/7	Method Blank	82	114	101	91

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-154634-2	MW-83S_081321	82
240-154644-L-3 MS	Matrix Spike	84
240-154644-Q-3 MSD	Matrix Spike Duplicate	87
LCS 240-500493/3	Lab Control Sample	85
MB 240-500493/4	Method Blank	85

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-500017/7
Matrix: Water
Analysis Batch: 500017

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/18/21 16:31	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/18/21 16:31	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/18/21 16:31	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/18/21 16:31	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/18/21 16:31	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/18/21 16:31	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*62 - 137*		*08/18/21 16:31*	*1*
4-Bromofluorobenzene (Surr)	*114*		*56 - 136*		*08/18/21 16:31*	*1*
Toluene-d8 (Surr)	*101*		*78 - 122*		*08/18/21 16:31*	*1*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*08/18/21 16:31*	*1*

Lab Sample ID: LCS 240-500017/4
Matrix: Water
Analysis Batch: 500017

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.69		ug/L		97	63 - 134
cis-1,2-Dichloroethene	10.0	9.72		ug/L		97	77 - 123
Tetrachloroethene	10.0	9.24		ug/L		92	76 - 123
trans-1,2-Dichloroethene	10.0	9.81		ug/L		98	75 - 124
Trichloroethene	10.0	9.42		ug/L		94	70 - 122
Vinyl chloride	10.0	10.8		ug/L		108	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*62 - 137*
4-Bromofluorobenzene (Surr)	*116*		*56 - 136*
Toluene-d8 (Surr)	*100*		*78 - 122*
Dibromofluoromethane (Surr)	*97*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-500493/4
Matrix: Water
Analysis Batch: 500493

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/20/21 22:07	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*08/20/21 22:07*	*1*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-500493/3
Matrix: Water
Analysis Batch: 500493

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.2		ug/L		102	80 - 122		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

Lab Sample ID: 240-154644-L-3 MS
Matrix: Water
Analysis Batch: 500493

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	9.72		ug/L		97	51 - 153		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*

Lab Sample ID: 240-154644-Q-3 MSD
Matrix: Water
Analysis Batch: 500493

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.0		ug/L		100	51 - 153	3	16

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154634-1

GC/MS VOA

Analysis Batch: 500017

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154634-1	TRIP BLANK_96	Total/NA	Water	8260B	
240-154634-2	MW-83S_081321	Total/NA	Water	8260B	
MB 240-500017/7	Method Blank	Total/NA	Water	8260B	
LCS 240-500017/4	Lab Control Sample	Total/NA	Water	8260B	

Analysis Batch: 500493

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154634-2	MW-83S_081321	Total/NA	Water	8260B SIM	
MB 240-500493/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-500493/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-154644-L-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-154644-Q-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154634-1

Client Sample ID: TRIP BLANK_96

Lab Sample ID: 240-154634-1

Date Collected: 08/13/21 00:00

Matrix: Water

Date Received: 08/17/21 10:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	500017	08/18/21 20:28	LRW	TAL CAN

Client Sample ID: MW-83S_081321

Lab Sample ID: 240-154634-2

Date Collected: 08/13/21 10:55

Matrix: Water

Date Received: 08/17/21 10:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	500017	08/18/21 20:52	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	500493	08/21/21 05:34	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154634-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

MICHIGAN 190

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Seth Turner		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30080642.402.04	Shipping/Tracking No:		
PO # 30080642.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below

10 day ☑ 3 weeks 2 weeks 1 week days 1 day

Containers & Preservatives

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM					Sample Specific Notes / Special Instructions:
TRIP BLANK_96				X						1							X	X	X	X	X	X	X					1 Trip Blank
MW-8US_081321	8/13/21	1055		X						6							X	X	X	X	X	X	X					3 VOAs for 8260B 3 VOAs for 8260B SIM

240-154634 Chain of Custody

Possible Hazard Identification

☑ Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

Return to Client ☑ Disposal By Lab Archive For Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Seth Turner	Arcadis	8/13/21 1400	Non Cold Storage	Arcadis	8/13/21 1400
Swetherspoon	Arcadis	8/16/21 954	Amanda Batthell	ETA	8/16/21 954
Amanda Batthell	ETA	8/16/21 1418	Received in Laboratory by: [illegible]	ETA	8-17-21 1040

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login #** 154634
Canton Facility

Client Arcadis Site Name

Cooler unpacked by Justin H

Cooler Received on 8-17-21 Opened on 8-17-21

FedEx 1st Grd (Exp) UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used (Bubble Wrap) Foam Plastic Bag None Other

COOLANT (Wet Ice) Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt ☒ See Multiple Cooler Form

IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp ____°C Corrected Cooler Temp ____°C

IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp ____°C Corrected Cooler Temp ____°C

2	Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No	
	-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No	NA
	-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)	
	-Were tamper/custody seals intact and uncompromised?	(Yes)	No	NA
3	Shippers' packing slip attached to the cooler(s)?	(Yes)	No	
4	Did custody papers accompany the sample(s)?	(Yes)	No	
5	Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No	
6	Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No	
7	Did all bottles arrive in good condition (Unbroken)?	(Yes)	No	
8	Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No	
9	For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?			
10	Were correct bottle(s) used for the test(s) indicated? 8-18-21	(Yes)	No	
11	Sufficient quantity received to perform indicated analyses?	(Yes)	No	
12	Are these work share samples and all listed on the COC?	Yes	(No)	
	If yes, Questions 13-17 have been checked at the originating laboratory			
13	Were all preserved sample(s) at the correct pH upon receipt?	Yes	No	(NA) pH Strip Lot# HC157842
14	Were VOAs on the COC?	(Yes)	No	
15	Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	(No)	NA
16	Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # covered	(Yes)	No	
17	Was a LL Hg or Me Hg trip blank present? ____	Yes	(No)	

Tests that are not checked for pH by Receiving

VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by

TB not to be analyzed for 8260-Sim

19 SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired

Sample(s) ____ were received in a broken container

Sample(s) ____ were received with bubble >6 mm in diameter (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory

Time preserved ____ Preservative(s) added/Lot number(s) ____

VOA Sample Preservation - Date/Time VOAs Frozen ____

WI-NC-099

Login # : 154634

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form

Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
(TA) Client Box Other	(IR-1) IR-12	4.1	4.2	(Wet Ice) Blue Ice Dry Ice Water None
(TA) Client Box Other	(IR-1) IR-12	4.6"	4.7	(Wet Ice) Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice

DATA VERIFICATION REPORT

August 31, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04_W01 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 154634-1
Sample date: 2021-08-13
Report received by CADENA: 2021-08-31
Initial Data Verification completed by CADENA: 2021-08-31
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch MS/MSD issues as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 154634-1

		Sample Name:	TRIP BLANK_96				MW-83S_081321			
		Lab Sample ID:	2401546341				2401546342			
		Sample Date:	8/13/2021				8/13/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

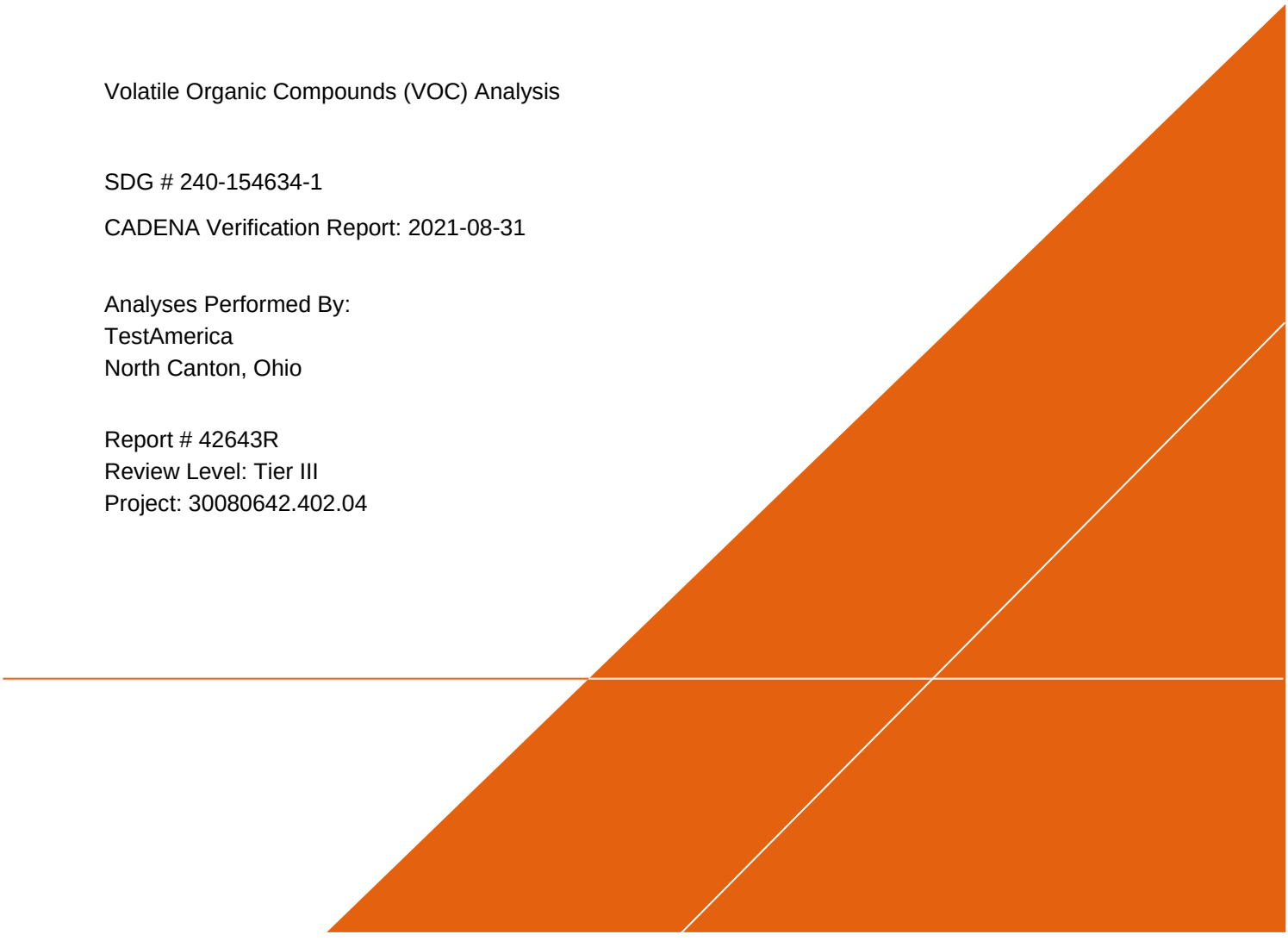
Volatile Organic Compounds (VOC) Analysis

SDG # 240-154634-1

CADENA Verification Report: 2021-08-31

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 42643R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-154634-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_96	240-154634-1	Water	08/13/21		X	
MW-83S_081321	240-154634-2	Water	08/13/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

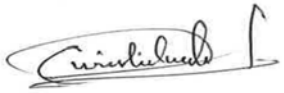
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: September 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: September 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Seth Turner		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30080642.402.04	Shipping/Tracking No:		
PO # 30080642.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below

10 day ✓ 3 weeks 2 weeks 1 week days 1 day

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_96				X						1							X	X	X	X	X	X	X	1 Trip Blank
MW-8US_081321	8/13/21	1055		X						6							X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-154634 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client ✓ Disposal By Lab Archive For Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
Seth Turner	Arcadis	8/13/21 1400	Now Cold Storage	Arcadis	8/13/21 1400
Swetherspoon	Arcadis	8/16/21 954	Amanda Batthell	ETA	8/16/21 954
Amanda Batthell	ETA	8/16/21 1418	Received in Laboratory by: [illegible]	ETA	8-17-21 1040

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Client Sample ID: TRIP BLANK_96
Lab Sample ID: 240-154634-1
Date Collected: 08/13/21 00:00
Matrix: Water
Date Received: 08/17/21 10:40

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/18/21 20:28	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/18/21 20:28	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/18/21 20:28	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/18/21 20:28	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/18/21 20:28	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/18/21 20:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*		*08/18/21 20:28*	*1*
4-Bromofluorobenzene (Surr)	*115*		*56 - 136*		*08/18/21 20:28*	*1*
Toluene-d8 (Surr)	*100*		*78 - 122*		*08/18/21 20:28*	*1*
Dibromofluoromethane (Surr)	*93*		*73 - 120*		*08/18/21 20:28*	*1*

Client Sample ID: MW-83S_081321
Lab Sample ID: 240-154634-2
Date Collected: 08/13/21 10:55
Matrix: Water
Date Received: 08/17/21 10:40

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/21/21 05:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*08/21/21 05:34*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/18/21 20:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/18/21 20:52	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/18/21 20:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/18/21 20:52	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/18/21 20:52	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/18/21 20:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*62 - 137*		*08/18/21 20:52*	*1*
4-Bromofluorobenzene (Surr)	*114*		*56 - 136*		*08/18/21 20:52*	*1*
Toluene-d8 (Surr)	*100*		*78 - 122*		*08/18/21 20:52*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*08/18/21 20:52*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-154153-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
8/23/2021 11:21:42 AM

Michael DelMonico, Project Manager I
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LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154153-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-154153-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-154153-1

Comments
No additional comments.

Receipt
The samples were received on 8/7/2021 9:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 1.1º C and 1.6º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154153-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154153-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-154153-1	TRIP BLANK_21	Water	08/05/21 00:00	08/07/21 08:00
240-154153-2	MW-84_080521	Water	08/05/21 13:50	08/07/21 08:00
240-154153-3	MW-84S_080521	Water	08/05/21 15:15	08/07/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154153-1

Client Sample ID: TRIP BLANK_21 — Lab Sample ID: 240-154153-1

No Detections.

Client Sample ID: MW-84_080521 — Lab Sample ID: 240-154153-2

No Detections.

Client Sample ID: MW-84S_080521 — Lab Sample ID: 240-154153-3

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154153-1

Client Sample ID: TRIP BLANK_21
Date Collected: 08/05/21 00:00
Date Received: 08/07/21 08:00

Lab Sample ID: 240-154153-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/12/21 15:14	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/12/21 15:14	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/12/21 15:14	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/12/21 15:14	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/12/21 15:14	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/12/21 15:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*75 - 130*		*08/12/21 15:14*	*1*
4-Bromofluorobenzene (Surr)	*112*		*47 - 134*		*08/12/21 15:14*	*1*
Toluene-d8 (Surr)	*104*		*69 - 122*		*08/12/21 15:14*	*1*
Dibromofluoromethane (Surr)	*97*		*78 - 129*		*08/12/21 15:14*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154153-1

Client Sample ID: MW-84_080521
Date Collected: 08/05/21 13:50
Date Received: 08/07/21 08:00

Lab Sample ID: 240-154153-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/12/21 23:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*		*08/12/21 23:45*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/12/21 15:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/12/21 15:38	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/12/21 15:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/12/21 15:38	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/12/21 15:38	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/12/21 15:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*75 - 130*		*08/12/21 15:38*	*1*
4-Bromofluorobenzene (Surr)	*113*		*47 - 134*		*08/12/21 15:38*	*1*
Toluene-d8 (Surr)	*103*		*69 - 122*		*08/12/21 15:38*	*1*
Dibromofluoromethane (Surr)	*95*		*78 - 129*		*08/12/21 15:38*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154153-1

Client Sample ID: MW-84S_080521
Date Collected: 08/05/21 15:15
Date Received: 08/07/21 08:00

Lab Sample ID: 240-154153-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/13/21 00:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*08/13/21 00:10*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/12/21 16:49	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/12/21 16:49	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/12/21 16:49	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/12/21 16:49	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/12/21 16:49	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/12/21 16:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*75 - 130*		*08/12/21 16:49*	*1*
4-Bromofluorobenzene (Surr)	*114*		*47 - 134*		*08/12/21 16:49*	*1*
Toluene-d8 (Surr)	*105*		*69 - 122*		*08/12/21 16:49*	*1*
Dibromofluoromethane (Surr)	*97*		*78 - 129*		*08/12/21 16:49*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154153-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-154153-1	TRIP BLANK_21	80	112	104	97
240-154153-2	MW-84_080521	80	113	103	95
240-154153-2 MS	MW-84_080521	79	115	105	100
240-154153-2 MSD	MW-84_080521	84	121	109	106
240-154153-3	MW-84S_080521	79	114	105	97
LCS 240-499272/4	Lab Control Sample	80	119	108	102
MB 240-499272/7	Method Blank	77	111	103	94

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-153956-J-2 MS	Matrix Spike	81
240-153956-M-2 MSD	Matrix Spike Duplicate	84
240-154153-2	MW-84_080521	79
240-154153-3	MW-84S_080521	80
LCS 240-499288/3	Lab Control Sample	80
MB 240-499288/4	Method Blank	80

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-499272/7
Matrix: Water
Analysis Batch: 499272

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/12/21 14:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/12/21 14:50	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/12/21 14:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/12/21 14:50	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/12/21 14:50	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/12/21 14:50	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*75 - 130*		*08/12/21 14:50*	*1*
4-Bromofluorobenzene (Surr)	*111*		*47 - 134*		*08/12/21 14:50*	*1*
Toluene-d8 (Surr)	*103*		*69 - 122*		*08/12/21 14:50*	*1*
Dibromofluoromethane (Surr)	*94*		*78 - 129*		*08/12/21 14:50*	*1*

Lab Sample ID: LCS 240-499272/4
Matrix: Water
Analysis Batch: 499272

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.0		ug/L		100	73 - 129
cis-1,2-Dichloroethene	10.0	10.0		ug/L		100	75 - 124
Tetrachloroethene	10.0	10.5		ug/L		105	70 - 125
trans-1,2-Dichloroethene	10.0	10.1		ug/L		101	74 - 130
Trichloroethene	10.0	10.3		ug/L		103	71 - 121
Vinyl chloride	10.0	9.03		ug/L		90	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*80*		*75 - 130*
4-Bromofluorobenzene (Surr)	*119*		*47 - 134*
Toluene-d8 (Surr)	*108*		*69 - 122*
Dibromofluoromethane (Surr)	*102*		*78 - 129*

Lab Sample ID: 240-154153-2 MS
Matrix: Water
Analysis Batch: 499272

Client Sample ID: MW-84_080521
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.73		ug/L		97	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	9.78		ug/L		98	68 - 121
Tetrachloroethene	1.0	U	10.0	10.2		ug/L		102	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.84		ug/L		98	69 - 126
Trichloroethene	1.0	U	10.0	10.1		ug/L		101	56 - 124
Vinyl chloride	1.0	U	10.0	8.17		ug/L		82	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*75 - 130*
4-Bromofluorobenzene (Surr)	*115*		*47 - 134*
Toluene-d8 (Surr)	*105*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-154153-2 MS
Matrix: Water
Analysis Batch: 499272

Client Sample ID: MW-84_080521
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	100		78 - 129

Lab Sample ID: 240-154153-2 MSD
Matrix: Water
Analysis Batch: 499272

Client Sample ID: MW-84_080521
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.72		ug/L		97	64 - 132	0	35
cis-1,2-Dichloroethene	1.0	U	10.0	9.59		ug/L		96	68 - 121	2	35
Tetrachloroethene	1.0	U	10.0	9.93		ug/L		99	52 - 129	3	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.65		ug/L		96	69 - 126	2	35
Trichloroethene	1.0	U	10.0	9.88		ug/L		99	56 - 124	2	35
Vinyl chloride	1.0	U	10.0	8.77		ug/L		88	49 - 136	7	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	84		75 - 130
4-Bromofluorobenzene (Surr)	121		47 - 134
Toluene-d8 (Surr)	109		69 - 122
Dibromofluoromethane (Surr)	106		78 - 129

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-499288/4
Matrix: Water
Analysis Batch: 499288

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/12/21 17:56	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	80		70 - 133		08/12/21 17:56	1

Lab Sample ID: LCS 240-499288/3
Matrix: Water
Analysis Batch: 499288

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.59		ug/L		96	80 - 135

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	80		70 - 133

Lab Sample ID: 240-153956-J-2 MS
Matrix: Water
Analysis Batch: 499288

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	9.68		ug/L		97	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

Lab Sample ID: 240-153956-M-2 MSD
Matrix: Water
Analysis Batch: 499288

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.63		ug/L		96	46 - 170	0	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*

GC/MS VOA

Analysis Batch: 499272

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154153-1	TRIP BLANK_21	Total/NA	Water	8260B	
240-154153-2	MW-84_080521	Total/NA	Water	8260B	
240-154153-3	MW-84S_080521	Total/NA	Water	8260B	
MB 240-499272/7	Method Blank	Total/NA	Water	8260B	
LCS 240-499272/4	Lab Control Sample	Total/NA	Water	8260B	
240-154153-2 MS	MW-84_080521	Total/NA	Water	8260B	
240-154153-2 MSD	MW-84_080521	Total/NA	Water	8260B	

Analysis Batch: 499288

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154153-2	MW-84_080521	Total/NA	Water	8260B SIM	
240-154153-3	MW-84S_080521	Total/NA	Water	8260B SIM	
MB 240-499288/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-499288/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-153956-J-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-153956-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154153-1

Client Sample ID: TRIP BLANK_21

Lab Sample ID: 240-154153-1
Date Collected: 08/05/21 00:00
Matrix: Water
Date Received: 08/07/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	499272	08/12/21 15:14	LRW	TAL CAN

Client Sample ID: MW-84_080521

Lab Sample ID: 240-154153-2
Date Collected: 08/05/21 13:50
Matrix: Water
Date Received: 08/07/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	499272	08/12/21 15:38	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	499288	08/12/21 23:45	CS	TAL CAN

Client Sample ID: MW-84S_080521

Lab Sample ID: 240-154153-3
Date Collected: 08/05/21 15:15
Matrix: Water
Date Received: 08/07/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	499272	08/12/21 16:49	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	499288	08/13/21 00:10	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154153-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

MICHIGAN 120

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COC
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT diffe om be w: 10 day; 3 weeks; ☑ 2 weeks; 1 week; 2 days; 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y/N)	Composite=C/Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions.
TRIP BLANK_21				X						1							X	X	X	X	X	X	X	1 Trip Blank
MW 84_080521	8/5/21	1350		X						6					N	C	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW 845_080521	8/5/21	1515		X						6					N	G	X	X	X	X	X	X	X	

240-154153 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; ☑ Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E20363
Level IV Reporting requested.

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
E Witherspoon	Arcadis	8/5/21 730	Navy Cold Storage	Arcadis	8/5/21 730
Relinquished by	Company	Date/Time	Received by	Company	Date/Time
E Witherspoon	Arcadis	8/6/21 1038	[signature]	EA	8/6/21 1038
Relinquished by	Company	Date/Time	Received in Laboratory by	Company	Date/Time
[signature]	EA	8/6/21 1155	[signature]	EA	8-7-21 0900

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8/23/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login #** · 154153
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by Brandon
Cooler Received on 8-7-21 Opened on 8-7-21
FedEx 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # 7 A Foam Box Client Cooler Box Other _____
Packing material used Bubble Wrap Foam Plastic Bag None Other _____
COOLANT: Wet Ice Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt ☒ See Multiple Cooler Form
IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp _____ °C Corrected Cooler Temp _____ °C
IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp _____ °C Corrected Cooler Temp _____ °C

2 Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 2 (1 each) Yes No
-Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
-Were tamper/custody seals intact and uncompromised? Yes No NA
3 Shippers' packing slip attached to the cooler(s)? Yes No
4 Did custody papers accompany the sample(s)? Yes No
5 Were the custody papers relinquished & signed in the appropriate place? Yes No
6 Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7 Did all bottles arrive in good condition (Unbroken)? Yes No
8 Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes No
9 For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10 Were correct bottle(s) used for the test(s) indicated? Yes No
11 Sufficient quantity received to perform indicated analyses? Yes No
12 Are these work share samples and all listed on the COC? Yes No
If yes, Questions 13-17 have been checked at the originating laboratory
13 Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# **HC157842**
14 Were VOAs on the COC? Yes No
15 Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes No NA
16 Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____ Yes No
17 Was a LL Hg or Me Hg trip blank present? _____ Yes No

Tests that are not checked for pH by Receiving.

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page Samples processed by JMR

The TB does not get logged ~~p~~ for SIM per PM.

19 SAMPLE CONDITION
Sample(s) _____ were received after the recommended holding time had expired
Sample(s) _____ were received in a broken container
Sample(s) _____ were received with bubble >6 mm in diameter (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory
Time preserved _____ Preservative(s) added/Lot number(s) _____

VOA Sample Preservation - Date/Time VOAs Frozen _____

WI NC-099

Login # : 154153

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form				
Cooler Description (Circle)	**IR Gun # (Circle)**	**Observed Temp °C**	**Corrected Temp °C**	**Coolant (Circle)**
TA Client Box Other	IR-11 IR-12	1.0	1.1	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12	1.5	1.6	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12	

DATA VERIFICATION REPORT

August 23, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04_W01 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 154153-1
Sample date: 2021-08-05
Report received by CADENA: 2021-08-23
Initial Data Verification completed by CADENA: 2021-08-23
Number of Samples:3
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, MS/MSD Recovery, MS/MSD RPD, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 154153-1

		Sample Name:	TRIP BLANK_21				MW-84_080521				MW-84S_080521			
		Lab Sample ID:	2401541531				2401541532				2401541533			
		Sample Date:	8/5/2021				8/5/2021				8/5/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC													
OSW-8260B													
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim													
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

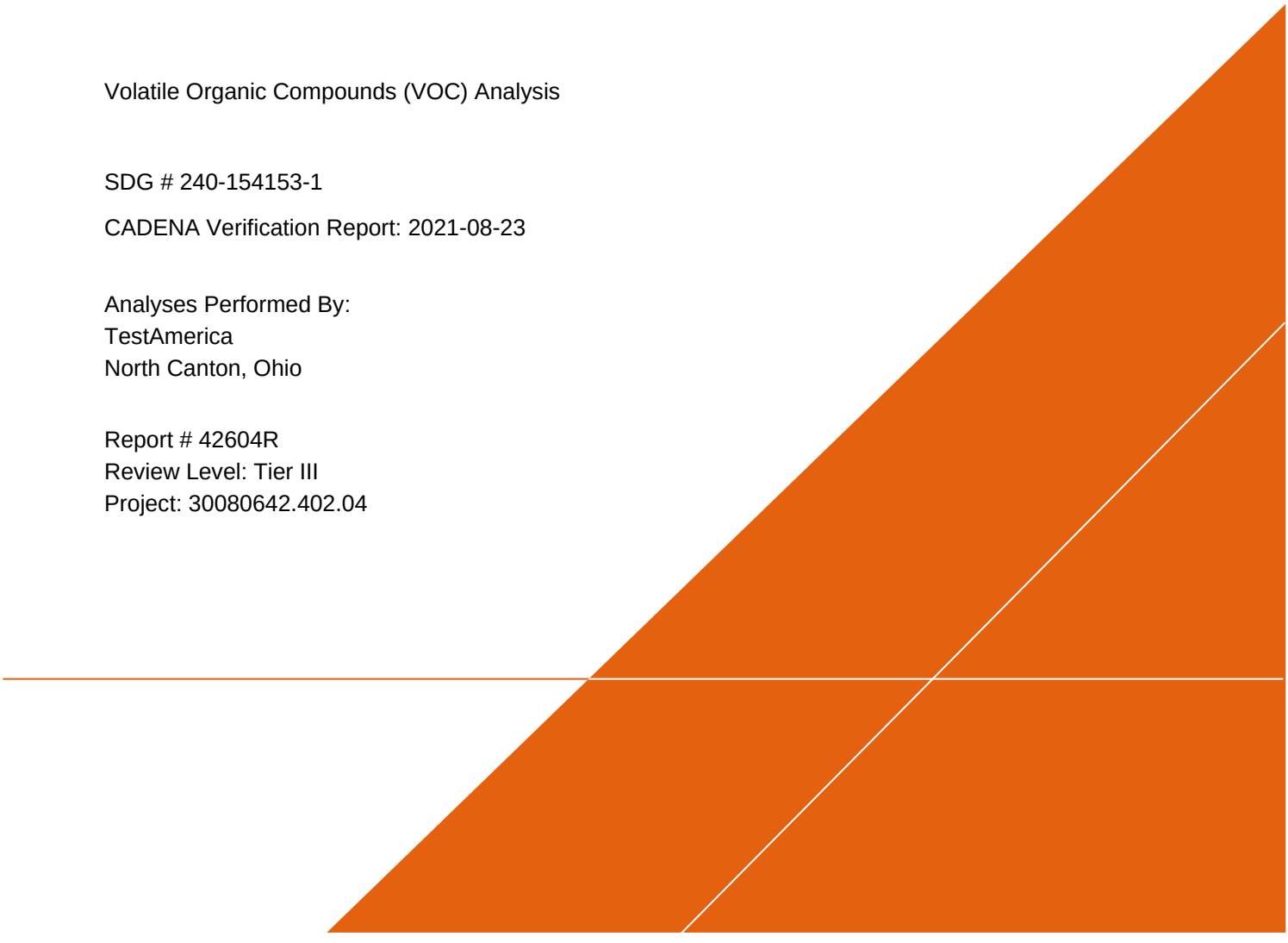
Volatile Organic Compounds (VOC) Analysis

SDG # 240-154153-1

CADENA Verification Report: 2021-08-23

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 42604R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-154153-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_21	240-154153-1	Water	08/05/21		X	
MW-84_080521	240-154153-2	Water	08/05/21		X	X
MW-84S_080521	240-154153-3	Water	08/05/21		X	X

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

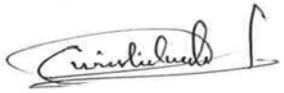
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: September 07, 2021

PEER REVIEW: Andrew Korycinski

DATE: September 8, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 120

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COC
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Emma Witherspoon	TAT diffe om be w: 10 day; 3 weeks; 2 weeks; 1 week; 2 days; 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y/N)	Composite=C/Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions
TRIP BLANK_21				X						1							X	X	X	X	X	X	X	1 Trip Blank
MW 84_080521	8/5/21	1350		X						6					N	C	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW 845_080521	8/5/21	1515		X						6					N	G	X	X	X	X	X	X	X	↓

240-154153 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E20363
Level IV Reporting requested.

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
E Witherspoon	Arcadis	8/5/21 730	Now Cold Storage	Arcadis	8/5/21 730
E Witherspoon	Arcadis	8/6/21 1038		EA	8/6/21 1038
	ETA	8/6/21 1155	Received in Laboratory by:		8-7-21 0900

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08/3/2021

Client Sample ID: TRIP BLANK_21
Lab Sample ID: 240-154153-1
Date Collected: 08/05/21 00:00
Matrix: Water
Date Received: 08/07/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/12/21 15:14	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/12/21 15:14	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/12/21 15:14	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/12/21 15:14	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/12/21 15:14	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/12/21 15:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*75 - 130*		*08/12/21 15:14*	*1*
4-Bromofluorobenzene (Surr)	*112*		*47 - 134*		*08/12/21 15:14*	*1*
Toluene-d8 (Surr)	*104*		*69 - 122*		*08/12/21 15:14*	*1*
Dibromofluoromethane (Surr)	*97*		*78 - 129*		*08/12/21 15:14*	*1*

Client Sample ID: MW-84_080521
Lab Sample ID: 240-154153-2
Date Collected: 08/05/21 13:50
Matrix: Water
Date Received: 08/07/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/12/21 23:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*		*08/12/21 23:45*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/12/21 15:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/12/21 15:38	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/12/21 15:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/12/21 15:38	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/12/21 15:38	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/12/21 15:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*75 - 130*		*08/12/21 15:38*	*1*
4-Bromofluorobenzene (Surr)	*113*		*47 - 134*		*08/12/21 15:38*	*1*
Toluene-d8 (Surr)	*103*		*69 - 122*		*08/12/21 15:38*	*1*
Dibromofluoromethane (Surr)	*95*		*78 - 129*		*08/12/21 15:38*	*1*

Client Sample ID: MW-84S_080521
Lab Sample ID: 240-154153-3
Date Collected: 08/05/21 15:15
Matrix: Water
Date Received: 08/07/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/13/21 00:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*08/13/21 00:10*	*1*

Client Sample ID: MW-84S_080521
Lab Sample ID: 240-154153-3

Date Collected: 08/05/21 15:15
Matrix: Water

Date Received: 08/07/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/12/21 16:49	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/12/21 16:49	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/12/21 16:49	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/12/21 16:49	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/12/21 16:49	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/12/21 16:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*75 - 130*		*08/12/21 16:49*	*1*
4-Bromofluorobenzene (Surr)	*114*		*47 - 134*		*08/12/21 16:49*	*1*
Toluene-d8 (Surr)	*105*		*69 - 122*		*08/12/21 16:49*	*1*
Dibromofluoromethane (Surr)	*97*		*78 - 129*		*08/12/21 16:49*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-154454-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
8/27/2021 3:53:21 PM
Opal Johnson, Project Manager II
(330)966-9279
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Designee for

Michael DelMonico, Project Manager I
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Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154454-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
S1+	Surrogate recovery exceeds control limits, high biased.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-154454-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-154454-1

Comments
No additional comments.

Receipt
The samples were received on 8/13/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.5º C.

GC/MS VOA
Method 8260B: Surrogate recovery for the following samples were outside the upper control limit: TRIP BLANK_83 (240-154454-1) and MW-108S_081121 (240-154454-2). This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Method 8260B: No MS/MSD in batch 499824 due to an incorrect dilution: TRIP BLANK_83 (240-154454-1) and MW-108S_081121 (240-154454-2)

Method 8260B SIM: The matrix spike/matrix spike duplicate (MS/MSD) for Analytical Batch 240-499882 is not reported due to the parent sample being re-analyzed for dilution.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154454-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154454-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-154454-1	TRIP BLANK_83	Water	08/11/21 00:00	08/13/21 08:00
240-154454-2	MW-108S_081121	Water	08/11/21 08:10	08/13/21 08:00
240-154454-3	MW-85SR_081121	Water	08/11/21 12:05	08/13/21 08:00
240-154454-4	MW-85_081121	Water	08/11/21 13:10	08/13/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154454-1

Client Sample ID: TRIP BLANK_83 — Lab Sample ID: 240-154454-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	0.72	J B	1.0	0.46	ug/L	1		8260B	Total/NA

Client Sample ID: MW-108S_081121 — Lab Sample ID: 240-154454-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	0.70	J B	1.0	0.46	ug/L	1		8260B	Total/NA

Client Sample ID: MW-85SR_081121 — Lab Sample ID: 240-154454-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	1.2		1.0	0.45	ug/L	1		8260B	Total/NA

Client Sample ID: MW-85_081121 — Lab Sample ID: 240-154454-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	3.8		1.0	0.45	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154454-1

Client Sample ID: TRIP BLANK_83
Date Collected: 08/11/21 00:00
Date Received: 08/13/21 08:00

Lab Sample ID: 240-154454-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/17/21 14:53	1
cis-1,2-Dichloroethene	**0.72**	**J B**	1.0	0.46	ug/L			08/17/21 14:53	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/17/21 14:53	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/17/21 14:53	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/17/21 14:53	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/17/21 14:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*134*	*S1+*	*75 - 130*		*08/17/21 14:53*	*1*
4-Bromofluorobenzene (Surr)	*66*		*47 - 134*		*08/17/21 14:53*	*1*
Toluene-d8 (Surr)	*95*		*69 - 122*		*08/17/21 14:53*	*1*
Dibromofluoromethane (Surr)	*111*		*78 - 129*		*08/17/21 14:53*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154454-1

Client Sample ID: MW-108S_081121
Date Collected: 08/11/21 08:10
Date Received: 08/13/21 08:00

Lab Sample ID: 240-154454-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/18/21 00:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*08/18/21 00:53*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/17/21 15:15	1
cis-1,2-Dichloroethene	**0.70**	**J B**	1.0	0.46	ug/L			08/17/21 15:15	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/17/21 15:15	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/17/21 15:15	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/17/21 15:15	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/17/21 15:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*140*	*S1+*	*75 - 130*		*08/17/21 15:15*	*1*
4-Bromofluorobenzene (Surr)	*66*		*47 - 134*		*08/17/21 15:15*	*1*
Toluene-d8 (Surr)	*94*		*69 - 122*		*08/17/21 15:15*	*1*
Dibromofluoromethane (Surr)	*113*		*78 - 129*		*08/17/21 15:15*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154454-1

Client Sample ID: MW-85SR_081121
Date Collected: 08/11/21 12:05
Date Received: 08/13/21 08:00

Lab Sample ID: 240-154454-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/18/21 01:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*08/18/21 01:17*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/19/21 20:18	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/19/21 20:18	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/19/21 20:18	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/19/21 20:18	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/19/21 20:18	1
Vinyl chloride	**1.2**		1.0	0.45	ug/L			08/19/21 20:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*		*08/19/21 20:18*	*1*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*		*08/19/21 20:18*	*1*
Toluene-d8 (Surr)	*94*		*69 - 122*		*08/19/21 20:18*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*08/19/21 20:18*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154454-1

Client Sample ID: MW-85_081121
Date Collected: 08/11/21 13:10
Date Received: 08/13/21 08:00

Lab Sample ID: 240-154454-4
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/18/21 01:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*08/18/21 01:42*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/19/21 20:40	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/19/21 20:40	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/19/21 20:40	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/19/21 20:40	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/19/21 20:40	1
Vinyl chloride	**3.8**		1.0	0.45	ug/L			08/19/21 20:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*		*08/19/21 20:40*	*1*
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*		*08/19/21 20:40*	*1*
Toluene-d8 (Surr)	*95*		*69 - 122*		*08/19/21 20:40*	*1*
Dibromofluoromethane (Surr)	*102*		*78 - 129*		*08/19/21 20:40*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154454-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-154454-1	TRIP BLANK_83	134 S1+	66	95	111
240-154454-2	MW-108S_081121	140 S1+	66	94	113
240-154454-3	MW-85SR_081121	97	91	94	99
240-154454-4	MW-85_081121	97	96	95	102
LCS 240-499824/4	Lab Control Sample	107	94	105	88
LCS 240-500199/4	Lab Control Sample	91	91	93	94
LCS 240-500199/9	Lab Control Sample	89	87	89	90
LCSD 240-500199/10	Lab Control Sample Dup	92	91	90	91
LCSD 240-500199/8	Lab Control Sample Dup	93	87	88	92
MB 240-499824/7	Method Blank	130	67	92	102
MB 240-500199/6	Method Blank	97	97	100	96

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-154454-2	MW-108S_081121	84
240-154454-3	MW-85SR_081121	84
240-154454-4	MW-85_081121	84
LCS 240-499882/3	Lab Control Sample	88
MB 240-499882/4	Method Blank	88

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-499824/7
Matrix: Water
Analysis Batch: 499824

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/17/21 13:48	1
cis-1,2-Dichloroethene	0.861	J	1.0	0.46	ug/L			08/17/21 13:48	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/17/21 13:48	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/17/21 13:48	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/17/21 13:48	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/17/21 13:48	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*130*		*75 - 130*		*08/17/21 13:48*	*1*
4-Bromofluorobenzene (Surr)	*67*		*47 - 134*		*08/17/21 13:48*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*08/17/21 13:48*	*1*
Dibromofluoromethane (Surr)	*102*		*78 - 129*		*08/17/21 13:48*	*1*

Lab Sample ID: LCS 240-499824/4
Matrix: Water
Analysis Batch: 499824

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.23		ug/L		82	73 - 129
cis-1,2-Dichloroethene	10.0	10.7		ug/L		107	75 - 124
Tetrachloroethene	10.0	9.57		ug/L		96	70 - 125
trans-1,2-Dichloroethene	10.0	10.0		ug/L		100	74 - 130
Trichloroethene	10.0	8.98		ug/L		90	71 - 121
Vinyl chloride	10.0	9.95		ug/L		100	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*107*		*75 - 130*
4-Bromofluorobenzene (Surr)	*94*		*47 - 134*
Toluene-d8 (Surr)	*105*		*69 - 122*
Dibromofluoromethane (Surr)	*88*		*78 - 129*

Lab Sample ID: MB 240-500199/6
Matrix: Water
Analysis Batch: 500199

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/19/21 13:35	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/19/21 13:35	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/19/21 13:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/19/21 13:35	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/19/21 13:35	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/19/21 13:35	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*		*08/19/21 13:35*	*1*
4-Bromofluorobenzene (Surr)	*97*		*47 - 134*		*08/19/21 13:35*	*1*
Toluene-d8 (Surr)	*100*		*69 - 122*		*08/19/21 13:35*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 240-500199/6
Matrix: Water
Analysis Batch: 500199

Client Sample ID: Method Blank
Prep Type: Total/NA

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	96		78 - 129		08/19/21 13:35	1

Lab Sample ID: LCS 240-500199/4
Matrix: Water
Analysis Batch: 500199

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	7.83		ug/L		78	73 - 129
cis-1,2-Dichloroethene	10.0	9.62		ug/L		96	75 - 124
Tetrachloroethene	10.0	7.89		ug/L		79	70 - 125
trans-1,2-Dichloroethene	10.0	9.67		ug/L		97	74 - 130
Trichloroethene	10.0	8.40		ug/L		84	71 - 121
Vinyl chloride	10.0	6.62		ug/L		66	61 - 134

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	91		75 - 130
4-Bromofluorobenzene (Surr)	91		47 - 134
Toluene-d8 (Surr)	93		69 - 122
Dibromofluoromethane (Surr)	94		78 - 129

Lab Sample ID: LCS 240-500199/9
Matrix: Water
Analysis Batch: 500199

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	89		75 - 130
4-Bromofluorobenzene (Surr)	87		47 - 134
Toluene-d8 (Surr)	89		69 - 122
Dibromofluoromethane (Surr)	90		78 - 129

Lab Sample ID: LCSD 240-500199/10
Matrix: Water
Analysis Batch: 500199

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	92		75 - 130
4-Bromofluorobenzene (Surr)	91		47 - 134
Toluene-d8 (Surr)	90		69 - 122
Dibromofluoromethane (Surr)	91		78 - 129

Lab Sample ID: LCSD 240-500199/8
Matrix: Water
Analysis Batch: 500199

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	10.0	10.4		ug/L		104	73 - 129	29	35
cis-1,2-Dichloroethene	10.0	10.0		ug/L		100	75 - 124	4	35
Tetrachloroethene	10.0	9.58		ug/L		96	70 - 125	19	35

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 240-500199/8
Matrix: Water
Analysis Batch: 500199

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
trans-1,2-Dichloroethene			10.0	10.0		ug/L		100	74 - 130	3	35
Trichloroethene			10.0	9.21		ug/L		92	71 - 121	9	35
Vinyl chloride			10.0	8.65		ug/L		87	61 - 134	27	35

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*
Toluene-d8 (Surr)	*88*		*69 - 122*
Dibromofluoromethane (Surr)	*92*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-499882/4
Matrix: Water
Analysis Batch: 499882

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/17/21 15:23	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*66 - 120*		*08/17/21 15:23*	*1*

Lab Sample ID: LCS 240-499882/3
Matrix: Water
Analysis Batch: 499882

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane			10.0	9.86		ug/L		99	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154454-1

GC/MS VOA

Analysis Batch: 499824

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154454-1	TRIP BLANK_83	Total/NA	Water	8260B	
240-154454-2	MW-108S_081121	Total/NA	Water	8260B	
MB 240-499824/7	Method Blank	Total/NA	Water	8260B	
LCS 240-499824/4	Lab Control Sample	Total/NA	Water	8260B	

Analysis Batch: 499882

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154454-2	MW-108S_081121	Total/NA	Water	8260B SIM	
240-154454-3	MW-85SR_081121	Total/NA	Water	8260B SIM	
240-154454-4	MW-85_081121	Total/NA	Water	8260B SIM	
MB 240-499882/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-499882/3	Lab Control Sample	Total/NA	Water	8260B SIM	

Analysis Batch: 500199

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154454-3	MW-85SR_081121	Total/NA	Water	8260B	
240-154454-4	MW-85_081121	Total/NA	Water	8260B	
MB 240-500199/6	Method Blank	Total/NA	Water	8260B	
LCS 240-500199/4	Lab Control Sample	Total/NA	Water	8260B	
LCS 240-500199/9	Lab Control Sample	Total/NA	Water	8260B	
LCSD 240-500199/10	Lab Control Sample Dup	Total/NA	Water	8260B	
LCSD 240-500199/8	Lab Control Sample Dup	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154454-1

Client Sample ID: TRIP BLANK_83
Date Collected: 08/11/21 00:00
Date Received: 08/13/21 08:00

Lab Sample ID: 240-154454-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	499824	08/17/21 14:53	LEE	TAL CAN

Client Sample ID: MW-108S_081121
Date Collected: 08/11/21 08:10
Date Received: 08/13/21 08:00

Lab Sample ID: 240-154454-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	499824	08/17/21 15:15	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	499882	08/18/21 00:53	CS	TAL CAN

Client Sample ID: MW-85SR_081121
Date Collected: 08/11/21 12:05
Date Received: 08/13/21 08:00

Lab Sample ID: 240-154454-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	500199	08/19/21 20:18	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	499882	08/18/21 01:17	CS	TAL CAN

Client Sample ID: MW-85_081121
Date Collected: 08/11/21 13:10
Date Received: 08/13/21 08:00

Lab Sample ID: 240-154454-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	500199	08/19/21 20:40	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	499882	08/18/21 01:42	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154454-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		COC No: 1 of 1 COCs
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	Analysis Turnaround Time	For lab use only
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:	TAT (if different from below): 10 day; 3 weeks; 2 weeks; 1 week; 2 days; 1 day	Walk-in client
Project Number: 30080642.402.04	Shipping/Tracking No:		Lab sampling
PO # 30080642.402.04			Job/SDG No:

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_83	---			X						1							X	X	X	X	X	X	X	1 Trip Blank
MW 108S_081121	8/11/21	810		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW 85R 081121	8/11/21	1205		X						6					N	G	X	X	X	X	X	X	X	
MW 85_081121	8/11	1310		X						6					N	G	X	X	X	X	X	X	X	

240-154454 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; ✓ Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E20363
Level IV Reporting requested

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
Emma Witherspoon	Arcadis	8/11/21 1500	Cold Storage	Arcadis	8/11/21 1500
Emma Witherspoon	Arcadis	8/12/21 1005	Amanda Battisti	ETA	8/12/21 1006
Amanda Battisti	ETA	8/12/21 1330	Brownlow	TA	8-13-21 0800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 154454**
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by Brandon

Cooler Received on 8-13-21 Opened on 8-13-21

FedEx 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used ~~Bubble Wrap~~ Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp 0.4 °C Corrected Cooler Temp 0.5 °C

IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp _____ °C Corrected Cooler Temp _____ °C

2	Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes No
	-Were the seals on the outside of the cooler(s) signed & dated?	Yes No NA
	-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes No
	-Were tamper/custody seals intact and uncompromised?	Yes No NA
3	Shippers' packing slip attached to the cooler(s)?	Yes No
4	Did custody papers accompany the sample(s)?	Yes No
5	Were the custody papers relinquished & signed in the appropriate place?	Yes No
6	Was/were the person(s) who collected the samples clearly identified on the COC?	Yes No
7	Did all bottles arrive in good condition (Unbroken)?	Yes No
8	Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes No
9	For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?	
10	Were correct bottle(s) used for the test(s) indicated?.	Yes No
11	Sufficient quantity received to perform indicated analyses?	Yes No
12	Are these work share samples and all listed on the COC?	Yes No
	If yes, Questions 13-17 have been checked at the originating laboratory	
13	Were all preserved sample(s) at the correct pH upon receipt?	Yes No NA pH Strip Lot# HC157842
14	Were VOAs on the COC?	Yes No
15	Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes No NA
16	Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #_____	Yes No
17	Was a LL Hg or Me Hg trip blank present? _____	Yes No

Tests that are not checked for pH by Receiving.

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page | Samples processed by

The TB is not logged for SIM per PM. GJ 8-16-21

19 SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired

Sample(s) _____ were received in a broken container

Sample(s) _____ were received with bubble >6 mm in diameter (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory

Time preserved _____ Preservative(s) added/Lot number(s). _____

VOA Sample Preservation - Date/Time VOAs Frozen _____

WI-NC-099

DATA VERIFICATION REPORT

August 28, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04_W01 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 154454-1
Sample date: 2021-08-11
Report received by CADENA: 2021-08-27
Initial Data Verification completed by CADENA: 2021-08-28
Number of Samples:4
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC and SIM QC batch MS/MSD issues as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

MBK/TBK - GCMS VOC QC batch 499824 method blank and trip blank had a detection below the RL for the following analyte: CIS-1,2-DICHLOROETHENE. The following client sample results should be considered to be non-detect at the RL and qualified with UB flags: -002.

SUR - GCMS VOC samples -001 and -002 surrogate recoveries were outliers biased high for 1 out of 4 surrogates. These client sample results should be considered to be estimated and qualified with J flags if detected. Non-detect results do not require qualification.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, LCS/LCD RPD, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Qualified Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 154454-1

		Sample Name:	TRIP BLANK_83				MW-108S_081121			
		Lab Sample ID:	2401544541				2401544542			
		Sample Date:	8/11/2021				8/11/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
cis-1,2-Dichloroethene	156-59-2	0.72	1.0	ug/l	J	0.70	1.0	ug/l	UB

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 154454-1

		Sample Name:	TRIP BLANK_83				MW-108S_081121				MW-85SR_081121				MW-85_081121			
		Lab Sample ID:	2401544541				2401544542				2401544543				2401544544			
		Sample Date:	8/11/2021				8/11/2021				8/11/2021				8/11/2021			
	Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC																		
	OSW-8260B																	
	1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	cis-1,2-Dichloroethene	156-59-2	0.72	1.0	ug/l	J	0.70	1.0	ug/l	UB	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	1.2	1.0	ug/l	---	3.8	1.0	ug/l	---
	OSW-8260BBSim																	
	1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

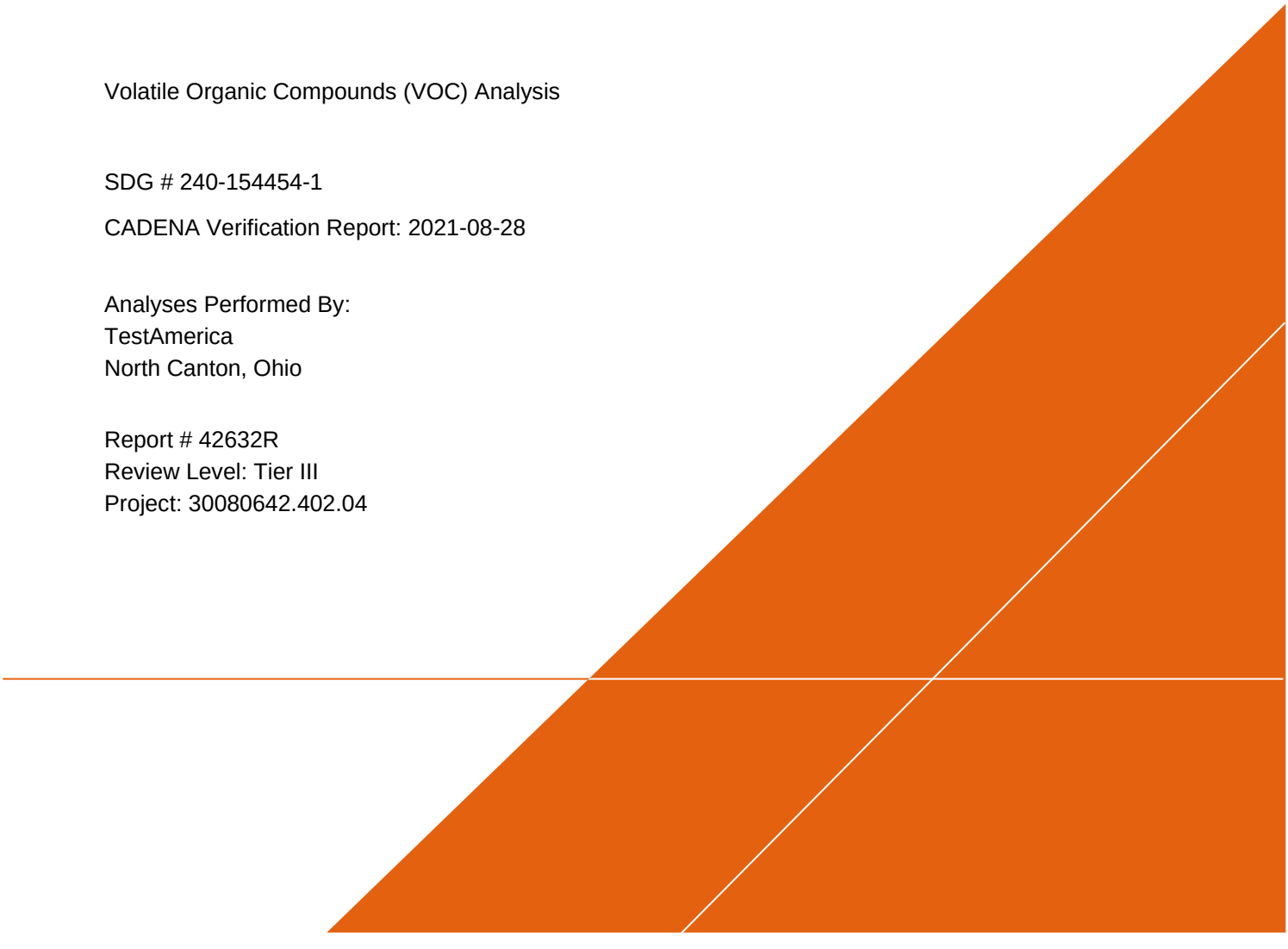
Volatile Organic Compounds (VOC) Analysis

SDG # 240-154454-1

CADENA Verification Report: 2021-08-28

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 42632R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-154454-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_83	240-154454-1	Water	08/11/21		X	
MW-108S_081121	240-154454-2	Water	08/11/21		X	X
MW-85SR_081121	240-154454-3	Water	08/11/21		X	X
MW-85_081121	240-154454-4	Water	08/11/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Lab file ID	Compound	Criteria
TRIP BLANK_83 MW-108S_081121	Continuous Calibration Verification %D	UXC8884.D	cis-1,2-Dichloroethene	+37.0%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	

Initial/Continuing	Criteria	Sample Result	Qualification
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

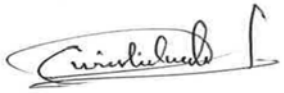
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: September 15, 2021

PEER REVIEW: Andrew Korycinski

DATE: September 16, 2021

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program	DW	NPDES	RCRA	Other
Company Name: Arcadis					
Address: 28550 Cabot Drive, Suite 500	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:	
City/State/Zip: Novi, MI, 48377	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs	
Phone: 248-994-2240	Email: kristoffer.hinskey@arcadis.com				
Project Name: Ford LTP Off-Site	Sampler Name: Emma Witherspoon				
Project Number: 30080642.402.04	Method of Shipment/Carrier:				
PO # 30080642.402.04	Shipping/Tracking No:				

Analysis Turnaround Time: TAT (if different from below) 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day

For lab use only: Walk-in client; Lab sampling; Job/SDG No:

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y/N)	Composite=C/Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes Special Instructions:
TRIP BLANK_83	---			X						1							X	X	X	X	X	X	X	1 Trip Blank
MW 108S_081121	8/11/21	810		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW 85SR 081121	8/11/21	1205		X						6					N	G	X	X	X	X	X	X	X	
MW 85_081121	8/11	1310		X						6					N	G	X	X	X	X	X	X	X	

240-154454 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E20363
Level IV Reporting requested

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
E Witherspoon	Arcadis	8/11/21 1500	Novi Cold Storage	Arcadis	8/11/21 1500
E Witherspoon	Arcadis	8/12/21 1005	Amanda Batthel	ETA	8/12/21 1006
Amanda Batthel	ETA	8/12/21 1330	Received in Laboratory by: Brownlow	TA	8-13-21 0800

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Client Sample ID: TRIP BLANK_83

Lab Sample ID: 240-154454-1

Date Collected: 08/11/21 00:00
Matrix: Water
Date Received: 08/13/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/17/21 14:53	1
cis-1,2-Dichloroethene	**0.72**	~~J B~~ J	1.0	0.46	ug/L			08/17/21 14:53	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/17/21 14:53	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/17/21 14:53	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/17/21 14:53	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/17/21 14:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*134*	*S1+*	*75 - 130*		*08/17/21 14:53*	*1*
4-Bromofluorobenzene (Surr)	*66*		*47 - 134*		*08/17/21 14:53*	*1*
Toluene-d8 (Surr)	*95*		*69 - 122*		*08/17/21 14:53*	*1*
Dibromofluoromethane (Surr)	*111*		*78 - 129*		*08/17/21 14:53*	*1*

Client Sample ID: MW-108S_081121

Lab Sample ID: 240-154454-2

Date Collected: 08/11/21 08:10
Matrix: Water
Date Received: 08/13/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/18/21 00:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*08/18/21 00:53*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/17/21 15:15	1
cis-1,2-Dichloroethene	~~0.70 J B~~		1.0	UBJ 0.46	ug/L			08/17/21 15:15	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/17/21 15:15	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/17/21 15:15	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/17/21 15:15	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/17/21 15:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*140*	*S1+*	*75 - 130*		*08/17/21 15:15*	*1*
4-Bromofluorobenzene (Surr)	*66*		*47 - 134*		*08/17/21 15:15*	*1*
Toluene-d8 (Surr)	*94*		*69 - 122*		*08/17/21 15:15*	*1*
Dibromofluoromethane (Surr)	*113*		*78 - 129*		*08/17/21 15:15*	*1*

Client Sample ID: MW-85SR_081121

Lab Sample ID: 240-154454-3

Date Collected: 08/11/21 12:05
Matrix: Water
Date Received: 08/13/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/18/21 01:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*08/18/21 01:17*	*1*

Client Sample ID: MW-85SR_081121
Lab Sample ID: 240-154454-3

Date Collected: 08/11/21 12:05
Matrix: Water
Date Received: 08/13/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/19/21 20:18	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/19/21 20:18	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/19/21 20:18	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/19/21 20:18	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/19/21 20:18	1
Vinyl chloride	**1.2**		1.0	0.45	ug/L			08/19/21 20:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*		*08/19/21 20:18*	*1*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*		*08/19/21 20:18*	*1*
Toluene-d8 (Surr)	*94*		*69 - 122*		*08/19/21 20:18*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*08/19/21 20:18*	*1*

Client Sample ID: MW-85_081121
Lab Sample ID: 240-154454-4

Date Collected: 08/11/21 13:10
Matrix: Water
Date Received: 08/13/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/18/21 01:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*08/18/21 01:42*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/19/21 20:40	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/19/21 20:40	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/19/21 20:40	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/19/21 20:40	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/19/21 20:40	1
Vinyl chloride	**3.8**		1.0	0.45	ug/L			08/19/21 20:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*		*08/19/21 20:40*	*1*
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*		*08/19/21 20:40*	*1*
Toluene-d8 (Surr)	*95*		*69 - 122*		*08/19/21 20:40*	*1*
Dibromofluoromethane (Surr)	*102*		*78 - 129*		*08/19/21 20:40*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-153961-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
8/19/2021 11:02:01 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-153961-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-153961-1

Job ID: 240-153961-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-153961-1

Comments
No additional comments.

Receipt
The samples were received on 8/5/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.1° C.

GC/MS VOA
Method 8260B SIM: The matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with analytical batch 240-499109 was not analyzed due to instrument failure.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-153961-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-153961-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-153961-1	TRIP BLANK_34	Water	08/03/21 00:00	08/05/21 08:00
240-153961-2	MW-86S_080321	Water	08/03/21 15:12	08/05/21 08:00
240-153961-3	MW-86_080321	Water	08/03/21 16:41	08/05/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-153961-1

Client Sample ID: TRIP BLANK_34 — Lab Sample ID: 240-153961-1

No Detections.

Client Sample ID: MW-86S_080321 — Lab Sample ID: 240-153961-2

No Detections.

Client Sample ID: MW-86_080321 — Lab Sample ID: 240-153961-3

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-153961-1

Client Sample ID: TRIP BLANK_34
Date Collected: 08/03/21 00:00
Date Received: 08/05/21 08:00

Lab Sample ID: 240-153961-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/09/21 18:09	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/09/21 18:09	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/09/21 18:09	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/09/21 18:09	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/09/21 18:09	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/09/21 18:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*08/09/21 18:09*	*1*
4-Bromofluorobenzene (Surr)	*80*		*47 - 134*		*08/09/21 18:09*	*1*
Toluene-d8 (Surr)	*96*		*69 - 122*		*08/09/21 18:09*	*1*
Dibromofluoromethane (Surr)	*92*		*78 - 129*		*08/09/21 18:09*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-153961-1

Client Sample ID: MW-86S_080321
Date Collected: 08/03/21 15:12
Date Received: 08/05/21 08:00

Lab Sample ID: 240-153961-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/13/21 20:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*08/13/21 20:43*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/09/21 18:31	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/09/21 18:31	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/09/21 18:31	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/09/21 18:31	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/09/21 18:31	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/09/21 18:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*08/09/21 18:31*	*1*
4-Bromofluorobenzene (Surr)	*81*		*47 - 134*		*08/09/21 18:31*	*1*
Toluene-d8 (Surr)	*94*		*69 - 122*		*08/09/21 18:31*	*1*
Dibromofluoromethane (Surr)	*96*		*78 - 129*		*08/09/21 18:31*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-153961-1

Client Sample ID: MW-86_080321
Date Collected: 08/03/21 16:41
Date Received: 08/05/21 08:00

Lab Sample ID: 240-153961-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/11/21 18:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*76*		*70 - 133*		*08/11/21 18:22*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/09/21 19:36	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/09/21 19:36	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/09/21 19:36	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/09/21 19:36	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/09/21 19:36	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/09/21 19:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*08/09/21 19:36*	*1*
4-Bromofluorobenzene (Surr)	*82*		*47 - 134*		*08/09/21 19:36*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*08/09/21 19:36*	*1*
Dibromofluoromethane (Surr)	*90*		*78 - 129*		*08/09/21 19:36*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-153961-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-153961-1	TRIP BLANK_34	100	80	96	92
240-153961-2	MW-86S_080321	104	81	94	96
240-153961-2 MS	MW-86S-MS_080321	94	104	105	88
240-153961-2 MSD	MW-86S-MSD_080321	98	102	102	90
240-153961-3	MW-86_080321	101	82	93	90
LCS 240-498640/4	Lab Control Sample	100	106	100	89
MB 240-498640/7	Method Blank	118	85	92	99

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-153961-2	MW-86S_080321	81
240-153961-2 MS	MW-86S-MS_080321	81
240-153961-2 MSD	MW-86S-MSD_080321	81
240-153961-3	MW-86_080321	76
LCS 240-499109/3	Lab Control Sample	78
LCS 240-499473/3	Lab Control Sample	84
MB 240-499109/4	Method Blank	78
MB 240-499473/4	Method Blank	80

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-498640/7
Matrix: Water
Analysis Batch: 498640

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/09/21 12:05	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/09/21 12:05	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/09/21 12:05	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/09/21 12:05	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/09/21 12:05	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/09/21 12:05	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*118*		*75 - 130*		*08/09/21 12:05*	*1*
4-Bromofluorobenzene (Surr)	*85*		*47 - 134*		*08/09/21 12:05*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*08/09/21 12:05*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*08/09/21 12:05*	*1*

Lab Sample ID: LCS 240-498640/4
Matrix: Water
Analysis Batch: 498640

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.15		ug/L		91	73 - 129
cis-1,2-Dichloroethene	10.0	10.4		ug/L		104	75 - 124
Tetrachloroethene	10.0	8.60		ug/L		86	70 - 125
trans-1,2-Dichloroethene	10.0	10.2		ug/L		102	74 - 130
Trichloroethene	10.0	9.47		ug/L		95	71 - 121
Vinyl chloride	10.0	9.94		ug/L		99	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*
4-Bromofluorobenzene (Surr)	*106*		*47 - 134*
Toluene-d8 (Surr)	*100*		*69 - 122*
Dibromofluoromethane (Surr)	*89*		*78 - 129*

Lab Sample ID: 240-153961-2 MS
Matrix: Water
Analysis Batch: 498640

Client Sample ID: MW-86S-MS_080321
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.49		ug/L		95	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	9.14		ug/L		91	68 - 121
Tetrachloroethene	1.0	U	10.0	7.91		ug/L		79	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.19		ug/L		92	69 - 126
Trichloroethene	1.0	U	10.0	8.29		ug/L		83	56 - 124
Vinyl chloride	1.0	U	10.0	11.9		ug/L		119	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*94*		*75 - 130*
4-Bromofluorobenzene (Surr)	*104*		*47 - 134*
Toluene-d8 (Surr)	*105*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-153961-2 MS
Matrix: Water
Analysis Batch: 498640

Client Sample ID: MW-86S-MS_080321
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*88*		*78 - 129*

Lab Sample ID: 240-153961-2 MSD
Matrix: Water
Analysis Batch: 498640

Client Sample ID: MW-86S-MSD_080321
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.39		ug/L		94	64 - 132	1	35
cis-1,2-Dichloroethene	1.0	U	10.0	9.87		ug/L		99	68 - 121	8	35
Tetrachloroethene	1.0	U	10.0	7.98		ug/L		80	52 - 129	1	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.60		ug/L		96	69 - 126	4	35
Trichloroethene	1.0	U	10.0	8.60		ug/L		86	56 - 124	4	35
Vinyl chloride	1.0	U	10.0	10.9		ug/L		109	49 - 136	8	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 130*
4-Bromofluorobenzene (Surr)	*102*		*47 - 134*
Toluene-d8 (Surr)	*102*		*69 - 122*
Dibromofluoromethane (Surr)	*90*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-499109/4
Matrix: Water
Analysis Batch: 499109

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/11/21 15:04	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*78*		*70 - 133*		*08/11/21 15:04*	*1*

Lab Sample ID: LCS 240-499109/3
Matrix: Water
Analysis Batch: 499109

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.23		ug/L		92	80 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*78*		*70 - 133*

Lab Sample ID: MB 240-499473/4
Matrix: Water
Analysis Batch: 499473

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/13/21 16:36	1

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*08/13/21 16:36*	*1*

Lab Sample ID: LCS 240-499473/3
Matrix: Water
Analysis Batch: 499473

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	9.61		ug/L		96	80 - 135		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*

Lab Sample ID: 240-153961-2 MS
Matrix: Water
Analysis Batch: 499473

Client Sample ID: MW-86S-MS_080321
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	9.90		ug/L		99	46 - 170		

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

Lab Sample ID: 240-153961-2 MSD
Matrix: Water
Analysis Batch: 499473

Client Sample ID: MW-86S-MSD_080321
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.57		ug/L		96	46 - 170	3	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-153961-1

GC/MS VOA

Analysis Batch: 498640

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-153961-1	TRIP BLANK_34	Total/NA	Water	8260B	
240-153961-2	MW-86S_080321	Total/NA	Water	8260B	
240-153961-3	MW-86_080321	Total/NA	Water	8260B	
MB 240-498640/7	Method Blank	Total/NA	Water	8260B	
LCS 240-498640/4	Lab Control Sample	Total/NA	Water	8260B	
240-153961-2 MS	MW-86S-MS_080321	Total/NA	Water	8260B	
240-153961-2 MSD	MW-86S-MSD_080321	Total/NA	Water	8260B	

Analysis Batch: 499109

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-153961-3	MW-86_080321	Total/NA	Water	8260B SIM	
MB 240-499109/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-499109/3	Lab Control Sample	Total/NA	Water	8260B SIM	

Analysis Batch: 499473

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-153961-2	MW-86S_080321	Total/NA	Water	8260B SIM	
MB 240-499473/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-499473/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-153961-2 MS	MW-86S-MS_080321	Total/NA	Water	8260B SIM	
240-153961-2 MSD	MW-86S-MSD_080321	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-153961-1

Client Sample ID: TRIP BLANK_34

Lab Sample ID: 240-153961-1
Matrix: Water
Date Collected: 08/03/21 00:00
Date Received: 08/05/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	498640	08/09/21 18:09	LEE	TAL CAN

Client Sample ID: MW-86S_080321

Lab Sample ID: 240-153961-2
Matrix: Water
Date Collected: 08/03/21 15:12
Date Received: 08/05/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	498640	08/09/21 18:31	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	499473	08/13/21 20:43	CS	TAL CAN

Client Sample ID: MW-86_080321

Lab Sample ID: 240-153961-3
Matrix: Water
Date Collected: 08/03/21 16:41
Date Received: 08/05/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	498640	08/09/21 19:36	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	499109	08/11/21 18:22	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-153961-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

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Chain of Custody Record

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	For lab use only
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	Walk-in client
Phone: 248-994-2240	Sampler Name: Andrew Baritt	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30080642.402.04	Shipping/Tracking No:			
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 34	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-865_080321	8/3/21	1512		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-865-MS_080321	8/3/21	1512		X						6					N	G	X	X	X	X	X	X	X	Run MS/MSD
MW-865-MSD_080321	8/3/21	1512		X						6					N	G	X	X	X	X	X	X	X	Run MS/MSD
MW-86_080321	8/3/21	1641		X						6					N	G	X	X	X	X	X	X	X	

240-153961 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	8/3/21 1745	Novi Cold Storage	Arcadis	8/3/21 1745
Relinquished by: [signature]	Company: Arcadis	Date/Time: 8/4/21 1004	Received by: [signature]	Company: ETA	Date/Time: 8/4/21 1004
Relinquished by: [signature]	Company: ETA	Date/Time: 8/4/21 11:33	Received in Laboratory by: [signature]	Company: ETA	Date/Time: 8-5-21 800

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8/19/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 153961**
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Nancy Roger

Cooler Received on 8-5-21 Opened on 8-5-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # A Foam Box Client Cooler Box Other _____

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2.0 °C Corrected Cooler Temp. 2.1 °C

IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	(Yes)	No
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?	(Yes)	No
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No	(NA) pH Strip Lot# HC157842
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 59072	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	(No)

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page Samples processed by: Tma

TB is not to be logged for SIM per PM.

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

WI-NC-099

DATA VERIFICATION REPORT

August 19, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04_W01 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 153961-1
Sample date: 2021-08-03
Report received by CADENA: 2021-08-19
Initial Data Verification completed by CADENA: 2021-08-19
Number of Samples:3
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

SIM GCMS VOC QC batch MS/MSD issues as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, MS/MSD Recovery, MS/MSD RPD, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 153961-1

		Sample Name:	TRIP BLANK_34				MW-86S_080321				MW-86_080321			
		Lab Sample ID:	2401539611				2401539612				2401539613			
		Sample Date:	8/3/2021				8/3/2021				8/3/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC													
OSW-8260B													
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim													
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

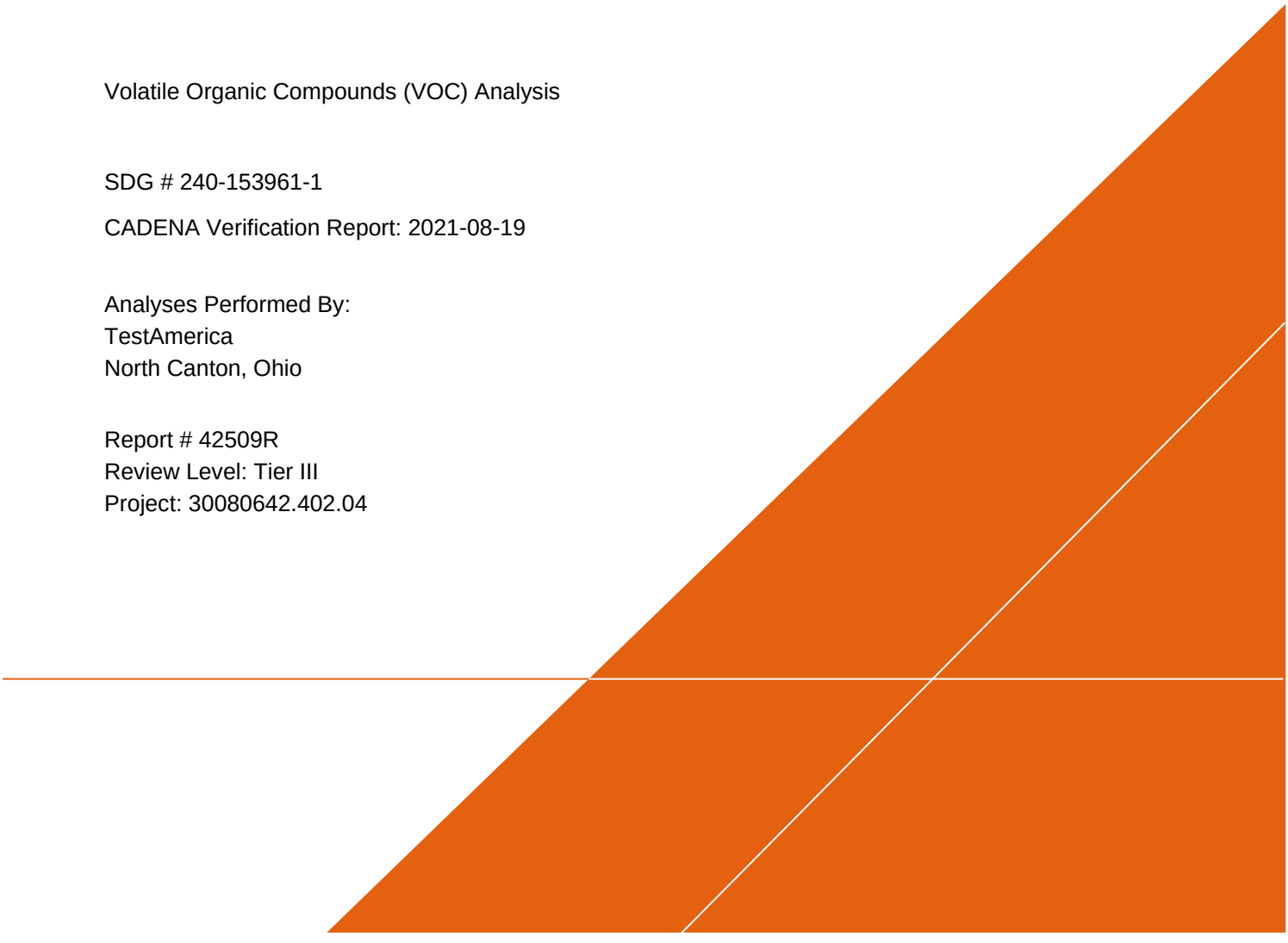
Volatile Organic Compounds (VOC) Analysis

SDG # 240-153961-1

CADENA Verification Report: 2021-08-19

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 42509R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-153961-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_34	240-153961-1	Water	08/03/21		X	
MW-86S_080321	240-153961-2	Water	08/03/21		X	X
MW-86_080321	240-153961-3	Water	08/03/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

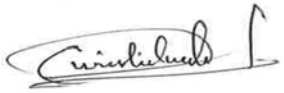
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: August 23, 2021

PEER REVIEW: Andrew Korycinski

DATE: August 24, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

2.0|2.1

Chain of Custody Record

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Andrew Baritt	TAT if different from below: 10 day; ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling:
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 34	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-865_080321	8/3/21	1512		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-865-MS_080321	8/3/21	1512		X						6					N	G	X	X	X	X	X	X	X	Run MS/MSD
MW-865-MSD_080321	8/3/21	1512		X						6					N	G	X	X	X	X	X	X	X	Run MS/MSD
MW-86_080321	8/3/21	1641		X						6					N	G	X	X	X	X	X	X	X	

240-153961 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Arcadis	8/3/21 1745	Novi Cold Storage	Arcadis	8/3/21 1745
Elizabeth Spooner	Arcadis	8/4/21 1004		ETA	8/4/21 1004
	ETA	8/4/21 11:33	Laboratory by:	ETA	8-5-21 800

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08/19/2021

Client Sample ID: TRIP BLANK_34
Lab Sample ID: 240-153961-1
Date Collected: 08/03/21 00:00
Matrix: Water
Date Received: 08/05/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/09/21 18:09	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/09/21 18:09	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/09/21 18:09	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/09/21 18:09	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/09/21 18:09	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/09/21 18:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*08/09/21 18:09*	*1*
4-Bromofluorobenzene (Surr)	*80*		*47 - 134*		*08/09/21 18:09*	*1*
Toluene-d8 (Surr)	*96*		*69 - 122*		*08/09/21 18:09*	*1*
Dibromofluoromethane (Surr)	*92*		*78 - 129*		*08/09/21 18:09*	*1*

Client Sample ID: MW-86S_080321
Lab Sample ID: 240-153961-2
Date Collected: 08/03/21 15:12
Matrix: Water
Date Received: 08/05/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/13/21 20:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*08/13/21 20:43*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/09/21 18:31	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/09/21 18:31	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/09/21 18:31	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/09/21 18:31	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/09/21 18:31	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/09/21 18:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*08/09/21 18:31*	*1*
4-Bromofluorobenzene (Surr)	*81*		*47 - 134*		*08/09/21 18:31*	*1*
Toluene-d8 (Surr)	*94*		*69 - 122*		*08/09/21 18:31*	*1*
Dibromofluoromethane (Surr)	*96*		*78 - 129*		*08/09/21 18:31*	*1*

Client Sample ID: MW-86_080321
Lab Sample ID: 240-153961-3
Date Collected: 08/03/21 16:41
Matrix: Water
Date Received: 08/05/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/11/21 18:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*76*		*70 - 133*		*08/11/21 18:22*	*1*

Client Sample ID: MW-86_080321
Lab Sample ID: 240-153961-3

Date Collected: 08/03/21 16:41
Matrix: Water

Date Received: 08/05/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/09/21 19:36	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/09/21 19:36	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/09/21 19:36	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/09/21 19:36	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/09/21 19:36	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/09/21 19:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*08/09/21 19:36*	*1*
4-Bromofluorobenzene (Surr)	*82*		*47 - 134*		*08/09/21 19:36*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*08/09/21 19:36*	*1*
Dibromofluoromethane (Surr)	*90*		*78 - 129*		*08/09/21 19:36*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-153873-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
8/18/2021 9:13:56 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-153873-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-153873-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-153873-1

Comments
No additional comments.

Receipt
The samples were received on 8/4/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.8º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-153873-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-153873-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-153873-1	TRIP BLANK_01	Water	08/02/21 00:00	08/04/21 08:00
240-153873-2	MW-87_080221	Water	08/02/21 13:46	08/04/21 08:00
240-153873-3	MW-87S_080221	Water	08/02/21 14:36	08/04/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-153873-1

Client Sample ID: TRIP BLANK_01 — Lab Sample ID: 240-153873-1

No Detections.

Client Sample ID: MW-87_080221 — Lab Sample ID: 240-153873-2

No Detections.

Client Sample ID: MW-87S_080221 — Lab Sample ID: 240-153873-3

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-153873-1

Client Sample ID: TRIP BLANK_01
Date Collected: 08/02/21 00:00
Date Received: 08/04/21 08:00

Lab Sample ID: 240-153873-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/05/21 21:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/05/21 21:07	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/05/21 21:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/05/21 21:07	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/05/21 21:07	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/05/21 21:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*115*		*75 - 130*		*08/05/21 21:07*	*1*
4-Bromofluorobenzene (Surr)	*72*		*47 - 134*		*08/05/21 21:07*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*08/05/21 21:07*	*1*
Dibromofluoromethane (Surr)	*104*		*78 - 129*		*08/05/21 21:07*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-153873-1

Client Sample ID: MW-87_080221
Date Collected: 08/02/21 13:46
Date Received: 08/04/21 08:00

Lab Sample ID: 240-153873-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/10/21 18:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*73*		*70 - 133*		*08/10/21 18:46*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/09/21 13:25	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/09/21 13:25	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/09/21 13:25	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/09/21 13:25	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/09/21 13:25	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/09/21 13:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*118*		*75 - 130*		*08/09/21 13:25*	*1*
4-Bromofluorobenzene (Surr)	*81*		*47 - 134*		*08/09/21 13:25*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*08/09/21 13:25*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*08/09/21 13:25*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-153873-1

Client Sample ID: MW-87S_080221
Date Collected: 08/02/21 14:36
Date Received: 08/04/21 08:00

Lab Sample ID: 240-153873-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/10/21 19:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*78*		*70 - 133*		*08/10/21 19:14*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/05/21 17:51	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/05/21 17:51	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/05/21 17:51	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/05/21 17:51	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/05/21 17:51	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/05/21 17:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*75 - 130*		*08/05/21 17:51*	*1*
4-Bromofluorobenzene (Surr)	*85*		*47 - 134*		*08/05/21 17:51*	*1*
Toluene-d8 (Surr)	*95*		*69 - 122*		*08/05/21 17:51*	*1*
Dibromofluoromethane (Surr)	*95*		*78 - 129*		*08/05/21 17:51*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-153873-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-153873-1	TRIP BLANK_01	115	72	90	104
240-153873-2	MW-87_080221	118	81	93	103
240-153873-3	MW-87S_080221	108	85	95	95
240-153873-3 MS	MW-87S-MS_080221	97	103	101	86
240-153873-3 MSD	MW-87S-MSD_080221	93	102	98	86
240-153961-E-2 MSD	Matrix Spike Duplicate	98	102	102	90
240-153961-H-2 MS	Matrix Spike	94	104	105	88
LCS 240-498239/4	Lab Control Sample	93	102	98	84
LCS 240-498640/4	Lab Control Sample	100	106	100	89
MB 240-498239/7	Method Blank	104	86	92	89
MB 240-498640/7	Method Blank	118	85	92	99

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-153873-2	MW-87_080221	73
240-153873-3	MW-87S_080221	78
240-153873-3 MS	MW-87S-MS_080221	76
240-153873-3 MSD	MW-87S-MSD_080221	74
LCS 240-498895/3	Lab Control Sample	73
MB 240-498895/4	Method Blank	77

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-498239/7
Matrix: Water
Analysis Batch: 498239

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/05/21 11:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/05/21 11:52	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/05/21 11:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/05/21 11:52	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/05/21 11:52	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/05/21 11:52	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*08/05/21 11:52*	*1*
4-Bromofluorobenzene (Surr)	*86*		*47 - 134*		*08/05/21 11:52*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*08/05/21 11:52*	*1*
Dibromofluoromethane (Surr)	*89*		*78 - 129*		*08/05/21 11:52*	*1*

Lab Sample ID: LCS 240-498239/4
Matrix: Water
Analysis Batch: 498239

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.77		ug/L		88	73 - 129
cis-1,2-Dichloroethene	10.0	10.2		ug/L		102	75 - 124
Tetrachloroethene	10.0	8.72		ug/L		87	70 - 125
trans-1,2-Dichloroethene	10.0	10.3		ug/L		103	74 - 130
Trichloroethene	10.0	9.21		ug/L		92	71 - 121
Vinyl chloride	10.0	8.90		ug/L		89	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*102*		*47 - 134*
Toluene-d8 (Surr)	*98*		*69 - 122*
Dibromofluoromethane (Surr)	*84*		*78 - 129*

Lab Sample ID: 240-153873-3 MS
Matrix: Water
Analysis Batch: 498239

Client Sample ID: MW-87S-MS_080221
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	6.86		ug/L		69	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	9.36		ug/L		94	68 - 121
Tetrachloroethene	1.0	U	10.0	7.61		ug/L		76	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.14		ug/L		91	69 - 126
Trichloroethene	1.0	U	10.0	8.08		ug/L		81	56 - 124
Vinyl chloride	1.0	U	10.0	8.42		ug/L		84	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*
Toluene-d8 (Surr)	*101*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-153873-3 MS
Matrix: Water
Analysis Batch: 498239

Client Sample ID: MW-87S-MS_080221
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	86		78 - 129

Lab Sample ID: 240-153873-3 MSD
Matrix: Water
Analysis Batch: 498239

Client Sample ID: MW-87S-MSD_080221
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	7.94		ug/L		79	64 - 132	15	35
cis-1,2-Dichloroethene	1.0	U	10.0	9.34		ug/L		93	68 - 121	0	35
Tetrachloroethene	1.0	U	10.0	8.15		ug/L		82	52 - 129	7	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.35		ug/L		94	69 - 126	2	35
Trichloroethene	1.0	U	10.0	8.56		ug/L		86	56 - 124	6	35
Vinyl chloride	1.0	U	10.0	9.14		ug/L		91	49 - 136	8	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	93		75 - 130
4-Bromofluorobenzene (Surr)	102		47 - 134
Toluene-d8 (Surr)	98		69 - 122
Dibromofluoromethane (Surr)	86		78 - 129

Lab Sample ID: MB 240-498640/7
Matrix: Water
Analysis Batch: 498640

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/09/21 12:05	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/09/21 12:05	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/09/21 12:05	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/09/21 12:05	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/09/21 12:05	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/09/21 12:05	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	118		75 - 130		08/09/21 12:05	1
4-Bromofluorobenzene (Surr)	85		47 - 134		08/09/21 12:05	1
Toluene-d8 (Surr)	92		69 - 122		08/09/21 12:05	1
Dibromofluoromethane (Surr)	99		78 - 129		08/09/21 12:05	1

Lab Sample ID: LCS 240-498640/4
Matrix: Water
Analysis Batch: 498640

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.15		ug/L		91	73 - 129
cis-1,2-Dichloroethene	10.0	10.4		ug/L		104	75 - 124
Tetrachloroethene	10.0	8.60		ug/L		86	70 - 125
trans-1,2-Dichloroethene	10.0	10.2		ug/L		102	74 - 130
Trichloroethene	10.0	9.47		ug/L		95	71 - 121

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-498640/4
Matrix: Water
Analysis Batch: 498640

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Vinyl chloride			10.0	9.94		ug/L		99	61 - 134		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*
4-Bromofluorobenzene (Surr)	*106*		*47 - 134*
Toluene-d8 (Surr)	*100*		*69 - 122*
Dibromofluoromethane (Surr)	*89*		*78 - 129*

Lab Sample ID: 240-153961-E-2 MSD
Matrix: Water
Analysis Batch: 498640

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.39		ug/L		94	64 - 132	1	35
cis-1,2-Dichloroethene	1.0	U	10.0	9.87		ug/L		99	68 - 121	8	35
Tetrachloroethene	1.0	U	10.0	7.98		ug/L		80	52 - 129	1	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.60		ug/L		96	69 - 126	4	35
Trichloroethene	1.0	U	10.0	8.60		ug/L		86	56 - 124	4	35
Vinyl chloride	1.0	U	10.0	10.9		ug/L		109	49 - 136	8	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 130*
4-Bromofluorobenzene (Surr)	*102*		*47 - 134*
Toluene-d8 (Surr)	*102*		*69 - 122*
Dibromofluoromethane (Surr)	*90*		*78 - 129*

Lab Sample ID: 240-153961-H-2 MS
Matrix: Water
Analysis Batch: 498640

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,1-Dichloroethene	1.0	U	10.0	9.49		ug/L		95	64 - 132		
cis-1,2-Dichloroethene	1.0	U	10.0	9.14		ug/L		91	68 - 121		
Tetrachloroethene	1.0	U	10.0	7.91		ug/L		79	52 - 129		
trans-1,2-Dichloroethene	1.0	U	10.0	9.19		ug/L		92	69 - 126		
Trichloroethene	1.0	U	10.0	8.29		ug/L		83	56 - 124		
Vinyl chloride	1.0	U	10.0	11.9		ug/L		119	49 - 136		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*94*		*75 - 130*
4-Bromofluorobenzene (Surr)	*104*		*47 - 134*
Toluene-d8 (Surr)	*105*		*69 - 122*
Dibromofluoromethane (Surr)	*88*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-498895/4
Matrix: Water
Analysis Batch: 498895

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/10/21 16:01	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*70 - 133*		*08/10/21 16:01*	*1*

Lab Sample ID: LCS 240-498895/3
Matrix: Water
Analysis Batch: 498895

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	11.0		ug/L		110	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*73*		*70 - 133*

Lab Sample ID: 240-153873-3 MS
Matrix: Water
Analysis Batch: 498895

Client Sample ID: MW-87S-MS_080221
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	8.95		ug/L		89	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*76*		*70 - 133*

Lab Sample ID: 240-153873-3 MSD
Matrix: Water
Analysis Batch: 498895

Client Sample ID: MW-87S-MSD_080221
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.11		ug/L		91	46 - 170	2	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*74*		*70 - 133*

GC/MS VOA

Analysis Batch: 498239

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-153873-1	TRIP BLANK_01	Total/NA	Water	8260B	
240-153873-3	MW-87S_080221	Total/NA	Water	8260B	
MB 240-498239/7	Method Blank	Total/NA	Water	8260B	
LCS 240-498239/4	Lab Control Sample	Total/NA	Water	8260B	
240-153873-3 MS	MW-87S-MS_080221	Total/NA	Water	8260B	
240-153873-3 MSD	MW-87S-MSD_080221	Total/NA	Water	8260B	

Analysis Batch: 498640

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-153873-2	MW-87_080221	Total/NA	Water	8260B	
MB 240-498640/7	Method Blank	Total/NA	Water	8260B	
LCS 240-498640/4	Lab Control Sample	Total/NA	Water	8260B	
240-153961-E-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	
240-153961-H-2 MS	Matrix Spike	Total/NA	Water	8260B	

Analysis Batch: 498895

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-153873-2	MW-87_080221	Total/NA	Water	8260B SIM	
240-153873-3	MW-87S_080221	Total/NA	Water	8260B SIM	
MB 240-498895/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-498895/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-153873-3 MS	MW-87S-MS_080221	Total/NA	Water	8260B SIM	
240-153873-3 MSD	MW-87S-MSD_080221	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-153873-1

Client Sample ID: TRIP BLANK_01

Lab Sample ID: 240-153873-1
Date Collected: 08/02/21 00:00
Matrix: Water
Date Received: 08/04/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	498239	08/05/21 21:07	LEE	TAL CAN

Client Sample ID: MW-87_080221

Lab Sample ID: 240-153873-2
Date Collected: 08/02/21 13:46
Matrix: Water
Date Received: 08/04/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	498640	08/09/21 13:25	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	498895	08/10/21 18:46	CS	TAL CAN

Client Sample ID: MW-87S_080221

Lab Sample ID: 240-153873-3
Date Collected: 08/02/21 14:36
Matrix: Water
Date Received: 08/04/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	498239	08/05/21 17:51	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	498895	08/10/21 19:14	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-153873-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

0.7/0.8

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 Brighton, MI 48116 / 810-229-2763

MICHIGAN 190

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No: 1 of 1 COCs
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: 10 day (✓) 3 weeks, 2 weeks, 1 week, 2 days, 1 day	For lab use only: Walk-in client; Lab sampling; Job/SDG No:
Project Name: Ford 1 TP Off-Site	Method of Shipment/Carrier:		
Project Number: 30080642.402.04	Shipping/Tracking No:		
PO # 30080642.402.04			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y/N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_01		---		X						1							X	X	X	X	X	X	X	1 Trip Blank
MW 87_080221	08/02/21	13.46		X						6					N		X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-87S-080202		1436		X						6					N	C	X	X	X	X	X	X	X	
MW 87S-MS-080221		1436		X						6					N		X	X	X	X	X	X	X	
MW 87S MSD_080221		1436		X						6					N	C	X	X	X	X	X	X	X	

240-153873 Chain of Custody

Possible Hazard Identification: (✓) Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may): Return to Client (✓)

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com, Cadena #E203631
Level IV Reporting requested

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
	Arcadis	08/02/21 1605	Novi, cold storage	Arcadis	08/02/21 1606
	4 rads	8/3/21 900		ETA	8/3/21 950
	ETA	8/3/21 1039	Received in Laboratory by:	TA	8-4-21 0800

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8/18/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 153873**
Canton Facility

Client Arcadis Site Name

Cooler Received on 8-4-21 Opened on 8-4-21

Cooler unpacked by: Brandon

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used. Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 0.1 °C Corrected Cooler Temp. 0.0 °C

IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp ____ °C

2	Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes No
	-Were the seals on the outside of the cooler(s) signed & dated?	Yes No NA
	-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes No
	-Were tamper/custody seals intact and uncompromised?	Yes No NA
3	Shippers' packing slip attached to the cooler(s)?	Yes No
4.	Did custody papers accompany the sample(s)?	Yes No
5	Were the custody papers relinquished & signed in the appropriate place?	Yes No
6	Was/were the person(s) who collected the samples clearly identified on the COC?	Yes No
7	Did all bottles arrive in good condition (Unbroken)?	Yes No
8	Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes No
9	For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?	
10	Were correct bottle(s) used for the test(s) indicated?	Yes No
11	Sufficient quantity received to perform indicated analyses?	Yes No
12	Are these work share samples and all listed on the COC?	Yes No
	If yes, Questions 13-17 have been checked at the originating laboratory	
13	Were all preserved sample(s) at the correct pH upon receipt?	Yes No NA pH Strip Lot# ~~HC033887~~ HC157842
14	Were VOAs on the COC?	Yes No
15	Were air bubbles >6 mm in any VOA vials? ● ← Larger than this	Yes No NA
16	Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ____	Yes No
17	Was a LL Hg or Me Hg trip blank present? ____	Yes No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by: TMP

Trip Blank is not to be logged for SEM per PM.

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired

Sample(s) ____ were received in a broken container

Sample(s) ____ were received with bubble >6 mm in diameter (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory

Time preserved ____ Preservative(s) added/Lot number(s) ____

VOA Sample Preservation - Date/Time VOAs Frozen ____

DATA VERIFICATION REPORT

August 18, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04_W01 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 153873-1
Sample date: 2021-08-02
Report received by CADENA: 2021-08-18
Initial Data Verification completed by CADENA: 2021-08-18
Number of Samples:3
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, MS/MSD Recovery, MS/MSD RPD, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 153873-1

		Sample Name:	TRIP BLANK_01				MW-87_080221				MW-87S_080221			
		Lab Sample ID:	2401538731				2401538732				2401538733			
		Sample Date:	8/2/2021				8/2/2021				8/2/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC													
OSW-8260B													
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim													
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

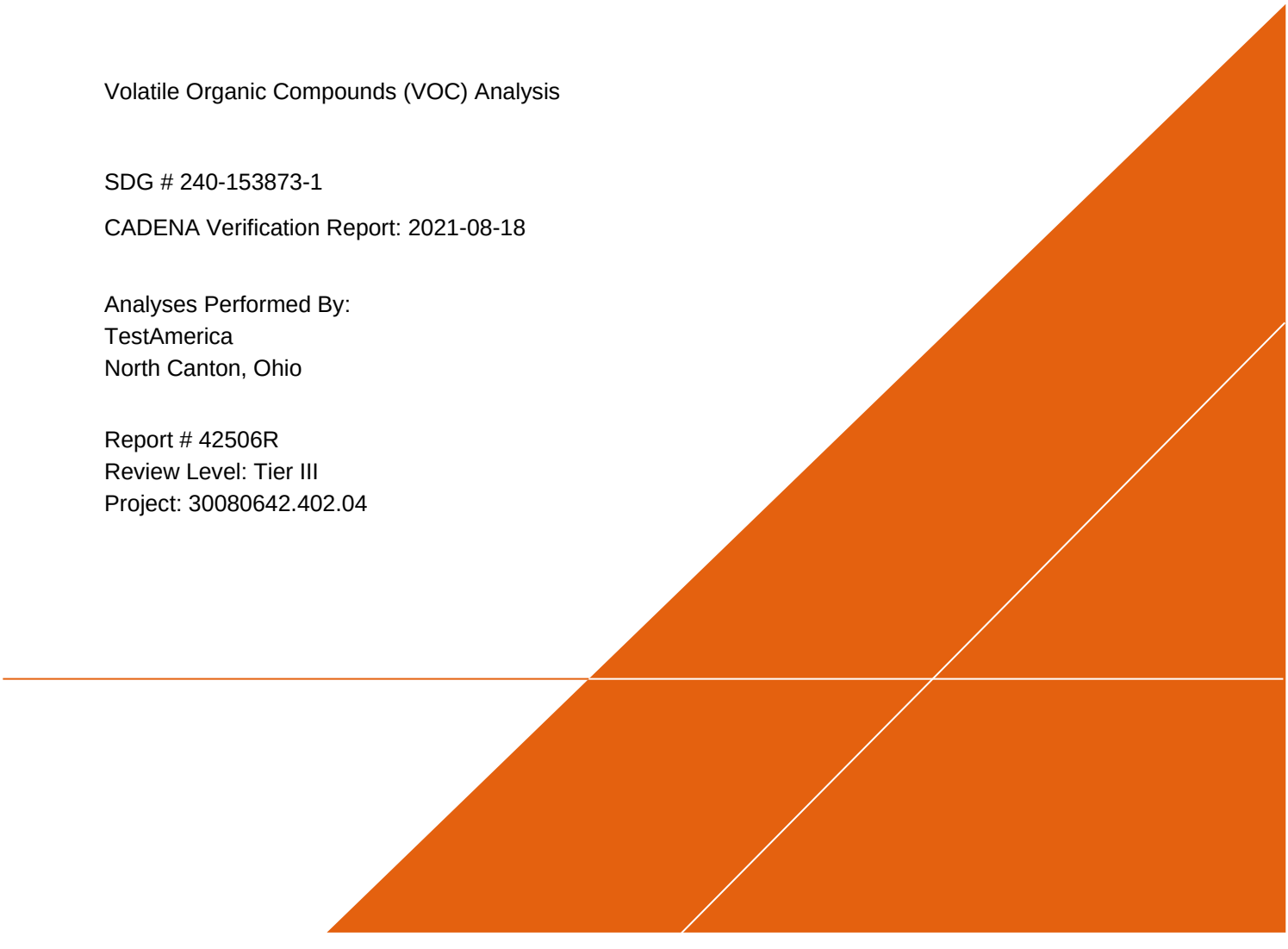
Volatile Organic Compounds (VOC) Analysis

SDG # 240-153873-1

CADENA Verification Report: 2021-08-18

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 42506R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-153873-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_01	240-153873-1	Water	08/02/21		X	
MW-87_080221	240-153873-2	Water	08/02/21		X	X
MW-87S_080221	240-153873-3	Water	08/02/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

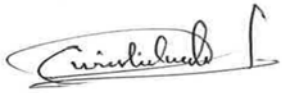
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: August 23, 2021

PEER REVIEW: Andrew Korycinski

DATE: August 24, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

0.7/0.8

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 Brighton, MI 48116 / 810-229-2763

MICHIGAN 190

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: 10 day (✓) 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Project Name: Ford I TP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				Sample Specific Notes / Special Instructions:

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y/N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM					Sample Specific Notes / Special Instructions:
TRIP BLANK_01		---		X						1							X	X	X	X	X	X	X					1 Trip Blank
MW 87_080221	08/02/21	13.46		X						6					N		X	X	X	X	X	X	X				*	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-87S-080202		1436		X						6					N	G	X	X	X	X	X	X	X					
MW 87S-MS-080221		1436		X						6					N		X	X	X	X	X	X	X					
MW 87S MSD_080221		1436		X						6					N	G	X	X	X	X	X	X	X					

240-153873 Chain of Custody

Possible Hazard Identification: (✓) Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may apply): Return to Client (✓)

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com, Cadena #E203631
Level IV Reporting requested

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
[signature]	Arcadis	08/02/21 1605	Novi cold storage	Arcadis	08/02/21 1606
[signature]	Arcadis	8/3/21 900	[signature]	ETA	8/3/21 950
[signature]	ETA	8/5/21 1039	[illegible]	TA	8-4-21 0800

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08/18/2021

Client Sample ID: TRIP BLANK_01
Lab Sample ID: 240-153873-1
Date Collected: 08/02/21 00:00
Matrix: Water
Date Received: 08/04/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/05/21 21:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/05/21 21:07	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/05/21 21:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/05/21 21:07	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/05/21 21:07	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/05/21 21:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*115*		*75 - 130*		*08/05/21 21:07*	*1*
4-Bromofluorobenzene (Surr)	*72*		*47 - 134*		*08/05/21 21:07*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*08/05/21 21:07*	*1*
Dibromofluoromethane (Surr)	*104*		*78 - 129*		*08/05/21 21:07*	*1*

Client Sample ID: MW-87_080221
Lab Sample ID: 240-153873-2
Date Collected: 08/02/21 13:46
Matrix: Water
Date Received: 08/04/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/10/21 18:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*73*		*70 - 133*		*08/10/21 18:46*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/09/21 13:25	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/09/21 13:25	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/09/21 13:25	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/09/21 13:25	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/09/21 13:25	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/09/21 13:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*118*		*75 - 130*		*08/09/21 13:25*	*1*
4-Bromofluorobenzene (Surr)	*81*		*47 - 134*		*08/09/21 13:25*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*08/09/21 13:25*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*08/09/21 13:25*	*1*

Client Sample ID: MW-87S_080221
Lab Sample ID: 240-153873-3
Date Collected: 08/02/21 14:36
Matrix: Water
Date Received: 08/04/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/10/21 19:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*78*		*70 - 133*		*08/10/21 19:14*	*1*

Client Sample ID: MW-87S_080221
Lab Sample ID: 240-153873-3

Date Collected: 08/02/21 14:36
Matrix: Water

Date Received: 08/04/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/05/21 17:51	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/05/21 17:51	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/05/21 17:51	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/05/21 17:51	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/05/21 17:51	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/05/21 17:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*75 - 130*		*08/05/21 17:51*	*1*
4-Bromofluorobenzene (Surr)	*85*		*47 - 134*		*08/05/21 17:51*	*1*
Toluene-d8 (Surr)	*95*		*69 - 122*		*08/05/21 17:51*	*1*
Dibromofluoromethane (Surr)	*95*		*78 - 129*		*08/05/21 17:51*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-154297-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
8/25/2021 9:59:31 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154297-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154297-1

Job ID: 240-154297-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-154297-1

Comments
No additional comments.

Receipt
The samples were received on 8/11/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.2º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154297-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154297-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-154297-1	TRIP BLANK_46	Water	08/09/21 00:00	08/11/21 08:00
240-154297-2	MW-96S_080921	Water	08/09/21 09:41	08/11/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154297-1

Client Sample ID: TRIP BLANK_46 — Lab Sample ID: 240-154297-1

No Detections.

Client Sample ID: MW-96S_080921 — Lab Sample ID: 240-154297-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154297-1

Client Sample ID: TRIP BLANK_46

Date Collected: 08/09/21 00:00
Date Received: 08/11/21 08:00

Lab Sample ID: 240-154297-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/13/21 11:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/13/21 11:19	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/13/21 11:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/13/21 11:19	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/13/21 11:19	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/13/21 11:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*90*		*75 - 130*		*08/13/21 11:19*	*1*
4-Bromofluorobenzene (Surr)	*82*		*47 - 134*		*08/13/21 11:19*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*08/13/21 11:19*	*1*
Dibromofluoromethane (Surr)	*95*		*78 - 129*		*08/13/21 11:19*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154297-1

Client Sample ID: MW-96S_080921
Date Collected: 08/09/21 09:41
Date Received: 08/11/21 08:00

Lab Sample ID: 240-154297-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/16/21 23:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*08/16/21 23:59*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/13/21 11:41	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/13/21 11:41	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/13/21 11:41	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/13/21 11:41	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/13/21 11:41	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/13/21 11:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*75 - 130*		*08/13/21 11:41*	*1*
4-Bromofluorobenzene (Surr)	*94*		*47 - 134*		*08/13/21 11:41*	*1*
Toluene-d8 (Surr)	*103*		*69 - 122*		*08/13/21 11:41*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*08/13/21 11:41*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154297-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-154235-C-2 MS	Matrix Spike	102	104	110	109
240-154235-C-2 MSD	Matrix Spike Duplicate	97	94	104	102
240-154297-1	TRIP BLANK_46	90	82	92	95
240-154297-2	MW-96S_080921	102	94	103	103
LCS 240-499381/4	Lab Control Sample	89	89	98	97
MB 240-499381/6	Method Blank	89	79	88	91

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-154289-F-2 MS	Matrix Spike	86
240-154289-F-2 MSD	Matrix Spike Duplicate	86
240-154297-2	MW-96S_080921	83
LCS 240-499687/3	Lab Control Sample	82
MB 240-499687/4	Method Blank	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-499381/6
Matrix: Water
Analysis Batch: 499381

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/13/21 10:35	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/13/21 10:35	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/13/21 10:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/13/21 10:35	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/13/21 10:35	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/13/21 10:35	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*75 - 130*		*08/13/21 10:35*	*1*
4-Bromofluorobenzene (Surr)	*79*		*47 - 134*		*08/13/21 10:35*	*1*
Toluene-d8 (Surr)	*88*		*69 - 122*		*08/13/21 10:35*	*1*
Dibromofluoromethane (Surr)	*91*		*78 - 129*		*08/13/21 10:35*	*1*

Lab Sample ID: LCS 240-499381/4
Matrix: Water
Analysis Batch: 499381

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.69		ug/L		97	73 - 129
cis-1,2-Dichloroethene	10.0	10.1		ug/L		101	75 - 124
Tetrachloroethene	10.0	8.84		ug/L		88	70 - 125
trans-1,2-Dichloroethene	10.0	9.86		ug/L		99	74 - 130
Trichloroethene	10.0	8.43		ug/L		84	71 - 121
Vinyl chloride	10.0	8.29		ug/L		83	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*75 - 130*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*
Toluene-d8 (Surr)	*98*		*69 - 122*
Dibromofluoromethane (Surr)	*97*		*78 - 129*

Lab Sample ID: 240-154235-C-2 MS
Matrix: Water
Analysis Batch: 499381

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	6.7	U	66.7	62.8		ug/L		94	64 - 132
cis-1,2-Dichloroethene	6.7	U	66.7	67.9		ug/L		102	68 - 121
Tetrachloroethene	6.7	U	66.7	60.8		ug/L		91	52 - 129
trans-1,2-Dichloroethene	6.7	U	66.7	63.9		ug/L		96	69 - 126
Trichloroethene	6.7	U	66.7	58.2		ug/L		87	56 - 124
Vinyl chloride	180	F1	66.7	216		ug/L		54	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*75 - 130*
4-Bromofluorobenzene (Surr)	*104*		*47 - 134*
Toluene-d8 (Surr)	*110*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-154235-C-2 MS
Matrix: Water
Analysis Batch: 499381

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*109*		*78 - 129*

Lab Sample ID: 240-154235-C-2 MSD
Matrix: Water
Analysis Batch: 499381

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	6.7	U	66.7	72.5		ug/L		109	64 - 132	14	35
cis-1,2-Dichloroethene	6.7	U	66.7	71.4		ug/L		107	68 - 121	5	35
Tetrachloroethene	6.7	U	66.7	66.4		ug/L		100	52 - 129	9	35
trans-1,2-Dichloroethene	6.7	U	66.7	69.8		ug/L		105	69 - 126	9	35
Trichloroethene	6.7	U	66.7	63.7		ug/L		95	56 - 124	9	35
Vinyl chloride	180	F1	66.7	192	F1	ug/L		18	49 - 136	12	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*
4-Bromofluorobenzene (Surr)	*94*		*47 - 134*
Toluene-d8 (Surr)	*104*		*69 - 122*
Dibromofluoromethane (Surr)	*102*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-499687/4
Matrix: Water
Analysis Batch: 499687

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/16/21 16:09	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*08/16/21 16:09*	*1*

Lab Sample ID: LCS 240-499687/3
Matrix: Water
Analysis Batch: 499687

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.70		ug/L		97	80 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-154289-F-2 MS
Matrix: Water
Analysis Batch: 499687

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	9.93		ug/L		99	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*

Lab Sample ID: 240-154289-F-2 MSD
Matrix: Water
Analysis Batch: 499687

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.4		ug/L		104	46 - 170	5	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154297-1

GC/MS VOA

Analysis Batch: 499381

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154297-1	TRIP BLANK_46	Total/NA	Water	8260B	
240-154297-2	MW-96S_080921	Total/NA	Water	8260B	
MB 240-499381/6	Method Blank	Total/NA	Water	8260B	
LCS 240-499381/4	Lab Control Sample	Total/NA	Water	8260B	
240-154235-C-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-154235-C-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 499687

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154297-2	MW-96S_080921	Total/NA	Water	8260B SIM	
MB 240-499687/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-499687/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-154289-F-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-154289-F-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154297-1

Client Sample ID: TRIP BLANK_46

Lab Sample ID: 240-154297-1

Date Collected: 08/09/21 00:00

Matrix: Water

Date Received: 08/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	499381	08/13/21 11:19	LEE	TAL CAN

Client Sample ID: MW-96S_080921

Lab Sample ID: 240-154297-2

Date Collected: 08/09/21 09:41

Matrix: Water

Date Received: 08/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	499381	08/13/21 11:41	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	499687	08/16/21 23:59	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154297-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

2.1/2.2

MICHIGAN 190

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Gary Schafer	TAT if different from below: 10 day; 3 weeks; 2 weeks; 1 week; days; 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM					Sample Specific Notes / Special Instructions:
TRIP BLANK_ 4lc		--		X						1							X	X	X	X	X	X	X					1 Trip Blank
MW-965_080921	08/09/21	9.41		X						6					N	G	X	X	X	X	X	X	X				X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-985_080921	08/09/21	13 36		X						6					N	G	X	X	X	X	X	X	X				X	L L

240-154297 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com Cadena #E203631
Level V Reporting requested

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
[signature]	Arcadis	08/09/21 1440	Novi cold storage	Arcadis	08/09/21 1441
[signature]	Arcadis	8/10/21 1018	[signature]	ETA	8/10/21 1020
[signature]	ETA	8/10/21 1113	Received in Laboratory by: [signature]	ETA	8-11-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 154297**
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by Brandon

Cooler Received on 8-11-21 Opened on 8-11-21

FedEx 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # 4 Foam Box Client Cooler Box Other _____

Packing material used Bubble Wrap Foam Plastic Bag None Other _____

COOLANT Wet Ice Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2.1 °C Corrected Cooler Temp 2.2 °C

IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp _____ °C Corrected Cooler Temp. _____ °C

2	Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity ___	Yes No
	-Were the seals on the outside of the cooler(s) signed & dated?	Yes No NA
	-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes No
	-Were tamper/custody seals intact and uncompromised?	Yes No NA
3	Shippers' packing slip attached to the cooler(s)?	Yes No
4	Did custody papers accompany the sample(s)?	Yes No
5	Were the custody papers relinquished & signed in the appropriate place?	Yes No
6	Was/were the person(s) who collected the samples clearly identified on the COC?	Yes No
7	Did all bottles arrive in good condition (Unbroken)?	Yes No
8	Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes No
9	For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?	
10	Were correct bottle(s) used for the test(s) indicated?	Yes No
11	Sufficient quantity received to perform indicated analyses?	Yes No
12	Are these work share samples and all listed on the COC?	Yes No
	If yes, Questions 13-17 have been checked at the originating laboratory	
13	Were all preserved sample(s) at the correct pH upon receipt?	Yes No NA pH Strip Lot# HC157842
14	Were VOAs on the COC?	Yes No
15	Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes No NA
16	Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____	Yes No
17	Was a LL Hg or Me Hg trip blank present? _____	Yes No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by Jme

The TB is not logged for SIM per PM.

19 SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired

Sample(s) _____ were received in a broken container

Sample(s) _____ were received with bubble >6 mm in diameter (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory

Time preserved _____ Preservative(s) added/Lot number(s) _____

VOA Sample Preservation - Date/Time VOAs Frozen _____

WI-NC-099

DATA VERIFICATION REPORT

August 25, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04_W01 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 154297-1
Sample date: 2021-08-09
Report received by CADENA: 2021-08-25
Initial Data Verification completed by CADENA: 2021-08-25
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 154297-1

		Sample Name:	TRIP BLANK_46				MW-96S_080921			
		Lab Sample ID:	2401542971				2401542972			
		Sample Date:	8/9/2021				8/9/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

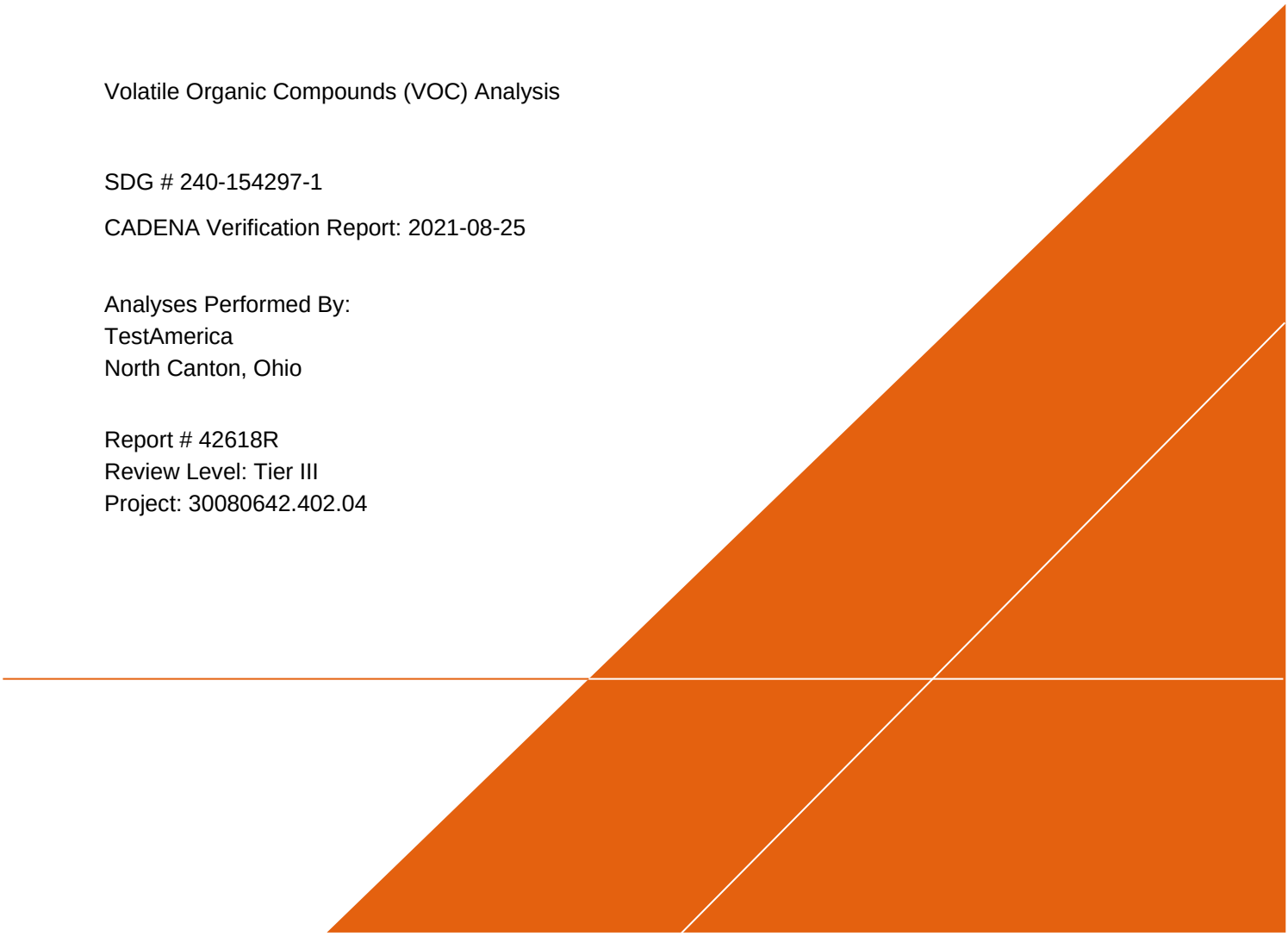
Volatile Organic Compounds (VOC) Analysis

SDG # 240-154297-1

CADENA Verification Report: 2021-08-25

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 42618R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-154297-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_46	240-154297-1	Water	08/09/21		X	
MW-96S_080921	240-154297-2	Water	08/09/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

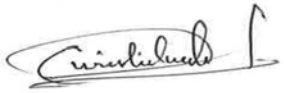
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: September 08, 2021

PEER REVIEW: Andrew Korycinski

DATE: September 08, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

2.1/2.2

MICHIGAN 190

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: 10 day; 3 weeks; 2 weeks; 1 week; days; 1 day		Walk-in client; Lab sampling; Job/SDG No:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			
Project Number: 30080642.402.04	Shipping/Tracking No:			
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM				Sample Specific Notes / Special Instructions:
TRIP BLANK_ 4le		--		X						1							X	X	X	X	X	X	X				1 Trip Blank
MW-965_080921	08/09/21	9.41		X						6					N	G	X	X	X	X	X	X	X			X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-985_080921	08/09/21	13 36		X						6					N	G	X	X	X	X	X	X	X			X	L L

240-154297 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com Cadena #E203631
Level V Reporting requested

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
[signature]	Arcadis	08/09/21 1440	Novi cold storage	Arcadis	08/09/21 1441
Relinquished by: [signature]	Company: Arcadis	Date/Time: 8/10/21 1018	Received by: [signature]	Company: ETA	Date/Time: 8/10/21 1080
Relinquished by: [signature]	Company: ETA	Date/Time: 8/10/21 1113	Received in Laboratory by: [signature]	Company: ETA	Date/Time: 8-11-21 800

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Client Sample ID: TRIP BLANK_46
Lab Sample ID: 240-154297-1
Date Collected: 08/09/21 00:00
Matrix: Water
Date Received: 08/11/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/13/21 11:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/13/21 11:19	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/13/21 11:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/13/21 11:19	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/13/21 11:19	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/13/21 11:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*90*		*75 - 130*		*08/13/21 11:19*	*1*
4-Bromofluorobenzene (Surr)	*82*		*47 - 134*		*08/13/21 11:19*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*08/13/21 11:19*	*1*
Dibromofluoromethane (Surr)	*95*		*78 - 129*		*08/13/21 11:19*	*1*

Client Sample ID: MW-96S_080921
Lab Sample ID: 240-154297-2
Date Collected: 08/09/21 09:41
Matrix: Water
Date Received: 08/11/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/16/21 23:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*08/16/21 23:59*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/13/21 11:41	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/13/21 11:41	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/13/21 11:41	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/13/21 11:41	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/13/21 11:41	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/13/21 11:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*75 - 130*		*08/13/21 11:41*	*1*
4-Bromofluorobenzene (Surr)	*94*		*47 - 134*		*08/13/21 11:41*	*1*
Toluene-d8 (Surr)	*103*		*69 - 122*		*08/13/21 11:41*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*08/13/21 11:41*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-154762-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
8/31/2021 10:17:31 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154762-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-154762-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-154762-1

Comments
No additional comments.

Receipt
The samples were received on 8/19/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.5º C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) associated with batch 500771 recovered above the upper control limit for one or multiple analytes. The samples associated with this CCV were non-detect for the affected analytes; therefore, the data have been reported. The associated sample is impacted: MW-102S_081621 (240-154762-2).

Method 8260B: NO MS/MSD in batch 500771 due to an incorrect dilution: MW-102S_081621 (240-154762-2).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154762-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154762-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-154762-1	TRIP BLANK_94	Water	08/16/21 00:00	08/19/21 10:54
240-154762-2	MW-102S_081621	Water	08/16/21 14:05	08/19/21 10:54

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154762-1

Client Sample ID: TRIP BLANK_94 — Lab Sample ID: 240-154762-1

No Detections.

Client Sample ID: MW-102S_081621 — Lab Sample ID: 240-154762-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154762-1

Client Sample ID: TRIP BLANK_94
Date Collected: 08/16/21 00:00
Date Received: 08/19/21 10:54

Lab Sample ID: 240-154762-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/23/21 15:41	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/23/21 15:41	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/23/21 15:41	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/23/21 15:41	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/23/21 15:41	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/23/21 15:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*122*		*62 - 137*		*08/23/21 15:41*	*1*
4-Bromofluorobenzene (Surr)	*79*		*56 - 136*		*08/23/21 15:41*	*1*
Toluene-d8 (Surr)	*96*		*78 - 122*		*08/23/21 15:41*	*1*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*08/23/21 15:41*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154762-1

Client Sample ID: MW-102S_081621
Date Collected: 08/16/21 14:05
Date Received: 08/19/21 10:54

Lab Sample ID: 240-154762-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/22/21 22:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*08/22/21 22:54*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/24/21 11:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/24/21 11:44	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 11:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/24/21 11:44	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 11:44	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/24/21 11:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*125*		*62 - 137*		*08/24/21 11:44*	*1*
4-Bromofluorobenzene (Surr)	*77*		*56 - 136*		*08/24/21 11:44*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*08/24/21 11:44*	*1*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*08/24/21 11:44*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154762-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-154385-C-13 MS	Matrix Spike	113	89	98	90
240-154385-C-13 MSD	Matrix Spike Duplicate	115	91	100	90
240-154762-1	TRIP BLANK_94	122	79	96	91
240-154762-2	MW-102S_081621	125	77	95	91
LCS 240-500603/4	Lab Control Sample	113	98	107	95
LCS 240-500771/4	Lab Control Sample	114	95	103	89
MB 240-500603/7	Method Blank	117	84	96	89
MB 240-500771/7	Method Blank	122	76	95	88

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-154762-2	MW-102S_081621	83
240-154770-I-2 MS	Matrix Spike	81
240-154770-O-2 MSD	Matrix Spike Duplicate	82
LCS 240-500522/3	Lab Control Sample	79
MB 240-500522/4	Method Blank	80

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-500603/7
Matrix: Water
Analysis Batch: 500603

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/23/21 11:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/23/21 11:38	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/23/21 11:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/23/21 11:38	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/23/21 11:38	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/23/21 11:38	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*62 - 137*		*08/23/21 11:38*	*1*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*		*08/23/21 11:38*	*1*
Toluene-d8 (Surr)	*96*		*78 - 122*		*08/23/21 11:38*	*1*
Dibromofluoromethane (Surr)	*89*		*73 - 120*		*08/23/21 11:38*	*1*

Lab Sample ID: LCS 240-500603/4
Matrix: Water
Analysis Batch: 500603

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.48		ug/L		95	63 - 134
cis-1,2-Dichloroethene	10.0	9.77		ug/L		98	77 - 123
Tetrachloroethene	10.0	8.50		ug/L		85	76 - 123
trans-1,2-Dichloroethene	10.0	9.59		ug/L		96	75 - 124
Trichloroethene	10.0	8.94		ug/L		89	70 - 122
Vinyl chloride	10.0	9.65		ug/L		97	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*113*		*62 - 137*
4-Bromofluorobenzene (Surr)	*98*		*56 - 136*
Toluene-d8 (Surr)	*107*		*78 - 122*
Dibromofluoromethane (Surr)	*95*		*73 - 120*

Lab Sample ID: 240-154385-C-13 MS
Matrix: Water
Analysis Batch: 500603

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*113*		*62 - 137*
4-Bromofluorobenzene (Surr)	*89*		*56 - 136*
Toluene-d8 (Surr)	*98*		*78 - 122*
Dibromofluoromethane (Surr)	*90*		*73 - 120*

Lab Sample ID: 240-154385-C-13 MSD
Matrix: Water
Analysis Batch: 500603

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*115*		*62 - 137*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-154385-C-13 MSD
Matrix: Water
Analysis Batch: 500603

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	*91*		*56 - 136*
Toluene-d8 (Surr)	*100*		*78 - 122*
Dibromofluoromethane (Surr)	*90*		*73 - 120*

Lab Sample ID: MB 240-500771/7
Matrix: Water
Analysis Batch: 500771

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/24/21 11:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/24/21 11:22	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 11:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/24/21 11:22	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 11:22	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/24/21 11:22	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*122*		*62 - 137*		*08/24/21 11:22*	*1*
4-Bromofluorobenzene (Surr)	*76*		*56 - 136*		*08/24/21 11:22*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*08/24/21 11:22*	*1*
Dibromofluoromethane (Surr)	*88*		*73 - 120*		*08/24/21 11:22*	*1*

Lab Sample ID: LCS 240-500771/4
Matrix: Water
Analysis Batch: 500771

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.91		ug/L		99	63 - 134
cis-1,2-Dichloroethene	10.0	10.6		ug/L		106	77 - 123
Tetrachloroethene	10.0	8.89		ug/L		89	76 - 123
trans-1,2-Dichloroethene	10.0	10.4		ug/L		104	75 - 124
Trichloroethene	10.0	9.35		ug/L		93	70 - 122
Vinyl chloride	10.0	10.1		ug/L		101	60 - 144

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*114*		*62 - 137*
4-Bromofluorobenzene (Surr)	*95*		*56 - 136*
Toluene-d8 (Surr)	*103*		*78 - 122*
Dibromofluoromethane (Surr)	*89*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-500522/4
Matrix: Water
Analysis Batch: 500522

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/22/21 18:21	1

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 240-500522/4
Matrix: Water
Analysis Batch: 500522

Client Sample ID: Method Blank
Prep Type: Total/NA

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	80		66 - 120		08/22/21 18:21	1

Lab Sample ID: LCS 240-500522/3
Matrix: Water
Analysis Batch: 500522

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	9.61		ug/L		96	80 - 122		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	79		66 - 120

Lab Sample ID: 240-154770-I-2 MS
Matrix: Water
Analysis Batch: 500522

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	10.5		ug/L		105	51 - 153		

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	81		66 - 120

Lab Sample ID: 240-154770-O-2 MSD
Matrix: Water
Analysis Batch: 500522

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	11.5		ug/L		115	51 - 153	10	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	82		66 - 120

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154762-1

GC/MS VOA

Analysis Batch: 500522

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154762-2	MW-102S_081621	Total/NA	Water	8260B SIM	
MB 240-500522/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-500522/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-154770-I-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-154770-O-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 500603

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154762-1	TRIP BLANK_94	Total/NA	Water	8260B	
MB 240-500603/7	Method Blank	Total/NA	Water	8260B	
LCS 240-500603/4	Lab Control Sample	Total/NA	Water	8260B	
240-154385-C-13 MS	Matrix Spike	Total/NA	Water	8260B	
240-154385-C-13 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 500771

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154762-2	MW-102S_081621	Total/NA	Water	8260B	
MB 240-500771/7	Method Blank	Total/NA	Water	8260B	
LCS 240-500771/4	Lab Control Sample	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154762-1

Client Sample ID: TRIP BLANK_94

Lab Sample ID: 240-154762-1

Date Collected: 08/16/21 00:00

Matrix: Water

Date Received: 08/19/21 10:54

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	500603	08/23/21 15:41	LEE	TAL CAN

Client Sample ID: MW-102S_081621

Lab Sample ID: 240-154762-2

Date Collected: 08/16/21 14:05

Matrix: Water

Date Received: 08/19/21 10:54

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	500771	08/24/21 11:44	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	500522	08/22/21 22:54	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154762-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton – 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	☐ DW ☐ NPDES ☐ RCRA ☐ Other			
Address: 28550 Cabot Drive, Suite 500	Client Project Manager: Kris Hinskey	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Telephone: 248-994-2240			
Phone: 248-994-2240	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Project Name: Ford LTP Off-Site	Sampler Name: Emma Witherspoon	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client:
Project Number: 30080642.402.04	Method of Shipment/Carrier:			Lab sampling:
PO # 30080642.402.04	Shipping/Tracking No:			Job/SDG No:

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 94	---	---		X						1							X	X	X	X	X	X	X	1 Trip Blank
MW-102S_081621	8/16/21	1405		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-154762 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

(A fee may be assessed if samples are retained longer than 1 month) ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Emma Witherspoon	Arcadis	8/16/21 1540	Novi cold storage	Arcadis	8/16/21 1540
Emma Witherspoon	Arcadis	8/18/21 935	Amanda Battled	ETA	8/18/21 935
Amanda Battled	ETA	8/18/21 1147	Received in Laboratory by:	TA	8-19-21 0900

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 154762**
Canton Facility

Client Arcadis Site Name

Cooler Received on 8-19-21 Opened on 8-19-21

Cooler unpacked by: Brandon

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: ~~Bubble Wrap~~ Foam Plastic Bag None Other

COOLANT: ~~Wet Ice~~ Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 0.4 °C Corrected Cooler Temp. 0.5 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes) No	
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes) No NA	
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes (No)	
-Were tamper/custody seals intact and uncompromised?	(Yes) No NA	
3. Shippers' packing slip attached to the cooler(s)?	Yes (No)	
4. Did custody papers accompany the sample(s)?	(Yes) No	
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes) No	
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes) No	
7. Did all bottles arrive in good condition (Unbroken)?	(Yes) No	
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes) No	
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes) No	
11. Sufficient quantity received to perform indicated analyses?	(Yes) No	
12. Are these work share samples and all listed on the COC?	Yes (No)	
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No (NA)	pH Strip Lot# HC157842
14. Were VOAs on the COC?	(Yes) No	
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes (No) NA	
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ____	(Yes) No	
17. Was a LL Hg or Me Hg trip blank present? ____	Yes (No)	

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by: DMR

The TB is not logged for SIM per PM.

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.

Sample(s) ____ were received in a broken container.

Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.

Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

August 31, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04_W01 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 154762-1
Sample date: 2021-08-16
Report received by CADENA: 2021-08-31
Initial Data Verification completed by CADENA: 2021-08-31
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch MS/MSD analytes dilued out as noted in the laboratory submittal case narrative or missing from data were not used to qualify client sample results as part of this level 2 data package verification review.

GCMS VOC QC batch CCV response outliers as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 154762-1

		Sample Name:	TRIP BLANK_94				MW-102S_081621			
		Lab Sample ID:	2401547621				2401547622			
		Sample Date:	8/16/2021				8/16/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

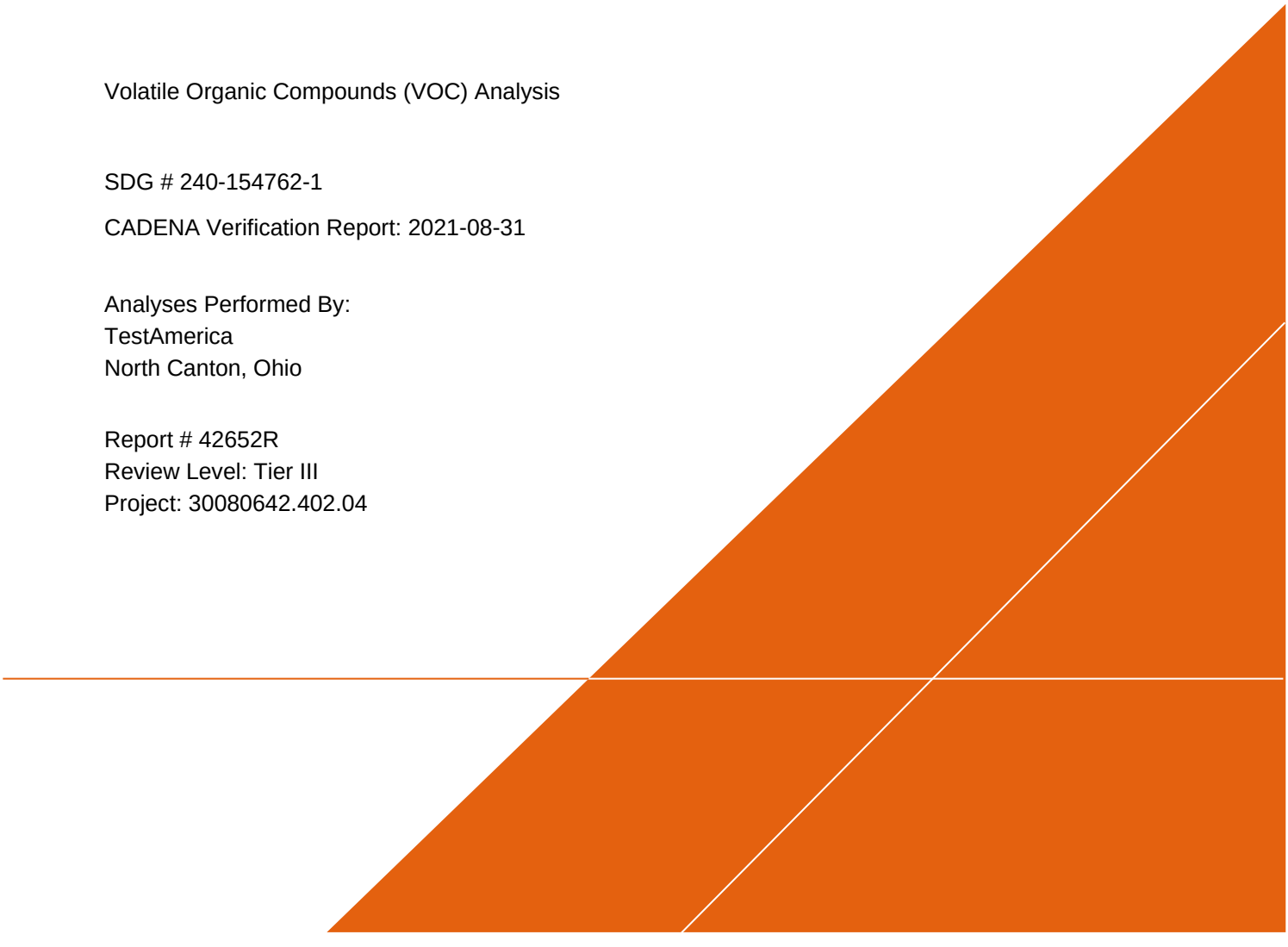
Volatile Organic Compounds (VOC) Analysis

SDG # 240-154762-1

CADENA Verification Report: 2021-08-31

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 42652R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-154762-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_94	240-154762-1	Water	08/16/21		X	
MW-102S_081621	240-154762-2	Water	08/16/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Lab file ID	Compound	Criteria
TRIP BLANK_94 MW-102S_081621	Continuous Calibration Verification %D	UXC9032.D	Vinyl Chloride	+26.9%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	

Initial/Continuing	Criteria	Sample Result	Qualification
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

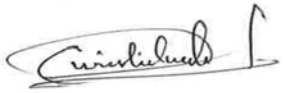
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: September 21, 2021

PEER REVIEW: Andrew Korycinski

DATE: September 21, 2021

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton – 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No: 1 of 1 COCs
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day	For lab use only: Walk-in client; Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		Job/SDG No:
Project Number: 30080642.402.04	Shipping/Tracking No:		
PO # 30080642.402.04			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 94	---	---		X						1							X	X	X	X	X	X	X	1 Trip Blank
MW-102S_081621	8/16/21	1405		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-154762 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

(A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
E Witherspoon	Arcadis	8/16/21 1540	Novi cold storage	Arcadis	8/16/21 1540
E Witherspoon	Arcadis	8/18/21 935	Amanda Battista	ETA	8/18/21 935
Amanda Battista	ETA	8/18/21 1147	Received in Laboratory by:	Company:	Date/Time: 8-19-21 0800

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08/31/2021

Client Sample ID: TRIP BLANK_94
Lab Sample ID: 240-154762-1
Date Collected: 08/16/21 00:00
Matrix: Water
Date Received: 08/19/21 10:54

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/23/21 15:41	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/23/21 15:41	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/23/21 15:41	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/23/21 15:41	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/23/21 15:41	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/23/21 15:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*122*		*62 - 137*		*08/23/21 15:41*	*1*
4-Bromofluorobenzene (Surr)	*79*		*56 - 136*		*08/23/21 15:41*	*1*
Toluene-d8 (Surr)	*96*		*78 - 122*		*08/23/21 15:41*	*1*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*08/23/21 15:41*	*1*

Client Sample ID: MW-102S_081621
Lab Sample ID: 240-154762-2
Date Collected: 08/16/21 14:05
Matrix: Water
Date Received: 08/19/21 10:54

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/22/21 22:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*08/22/21 22:54*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/24/21 11:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/24/21 11:44	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 11:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/24/21 11:44	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 11:44	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/24/21 11:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*125*		*62 - 137*		*08/24/21 11:44*	*1*
4-Bromofluorobenzene (Surr)	*77*		*56 - 136*		*08/24/21 11:44*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*08/24/21 11:44*	*1*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*08/24/21 11:44*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-154453-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
8/27/2021 3:52:32 PM
Opal Johnson, Project Manager II
(330)966-9279
opal.johnson@eurofinset.com

Designee for

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154453-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
S1+	Surrogate recovery exceeds control limits, high biased.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-154453-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-154453-1

Comments
No additional comments.

Receipt
The samples were received on 8/13/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.5º C.

GC/MS VOA
Method 8260B: Surrogate recovery for the following samples were outside the upper control limit: TRIP BLANK_71 (240-154453-1) and MW-106S_081121 (240-154453-2). This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Method 8260B: No MS/MSD in batch 499824 due to an incorrect dilution: TRIP BLANK_71 (240-154453-1) and MW-106S_081121 (240-154453-2)

Method 8260B SIM: The matrix spike/matrix spike duplicate (MS/MSD) for Analytical Batch 240-499882 is not reported due to the parent sample being re-analyzed for dilution.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154453-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154453-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-154453-1	TRIP BLANK_71	Water	08/11/21 00:00	08/13/21 08:00
240-154453-2	MW-106S_081121	Water	08/11/21 13:19	08/13/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154453-1

Client Sample ID: TRIP BLANK_71 — Lab Sample ID: 240-154453-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	0.83	J B	1.0	0.46	ug/L	1		8260B	Total/NA

Client Sample ID: MW-106S_081121 — Lab Sample ID: 240-154453-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	0.78	J B	1.0	0.46	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154453-1

Client Sample ID: TRIP BLANK_71

Date Collected: 08/11/21 00:00
Date Received: 08/13/21 08:00

Lab Sample ID: 240-154453-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/17/21 14:10	1
cis-1,2-Dichloroethene	**0.83**	**J B**	1.0	0.46	ug/L			08/17/21 14:10	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/17/21 14:10	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/17/21 14:10	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/17/21 14:10	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/17/21 14:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*132*	*S1+*	*75 - 130*		*08/17/21 14:10*	*1*
4-Bromofluorobenzene (Surr)	*66*		*47 - 134*		*08/17/21 14:10*	*1*
Toluene-d8 (Surr)	*91*		*69 - 122*		*08/17/21 14:10*	*1*
Dibromofluoromethane (Surr)	*106*		*78 - 129*		*08/17/21 14:10*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154453-1

Client Sample ID: MW-106S_081121
Date Collected: 08/11/21 13:19
Date Received: 08/13/21 08:00

Lab Sample ID: 240-154453-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/18/21 00:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*66 - 120*		*08/18/21 00:28*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/17/21 14:32	1
cis-1,2-Dichloroethene	**0.78**	**J B**	1.0	0.46	ug/L			08/17/21 14:32	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/17/21 14:32	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/17/21 14:32	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/17/21 14:32	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/17/21 14:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*134*	*S1+*	*75 - 130*		*08/17/21 14:32*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*08/17/21 14:32*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*08/17/21 14:32*	*1*
Dibromofluoromethane (Surr)	*107*		*78 - 129*		*08/17/21 14:32*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154453-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-154453-1	TRIP BLANK_71	132 S1+	66	91	106
240-154453-2	MW-106S_081121	134 S1+	65	92	107
LCS 240-499824/4	Lab Control Sample	107	94	105	88
MB 240-499824/7	Method Blank	130	67	92	102

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-154453-2	MW-106S_081121	86
LCS 240-499882/3	Lab Control Sample	88
MB 240-499882/4	Method Blank	88

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-499824/7
Matrix: Water
Analysis Batch: 499824

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/17/21 13:48	1
cis-1,2-Dichloroethene	0.861	J	1.0	0.46	ug/L			08/17/21 13:48	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/17/21 13:48	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/17/21 13:48	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/17/21 13:48	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/17/21 13:48	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*130*		*75 - 130*		*08/17/21 13:48*	*1*
4-Bromofluorobenzene (Surr)	*67*		*47 - 134*		*08/17/21 13:48*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*08/17/21 13:48*	*1*
Dibromofluoromethane (Surr)	*102*		*78 - 129*		*08/17/21 13:48*	*1*

Lab Sample ID: LCS 240-499824/4
Matrix: Water
Analysis Batch: 499824

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.23		ug/L		82	73 - 129
cis-1,2-Dichloroethene	10.0	10.7		ug/L		107	75 - 124
Tetrachloroethene	10.0	9.57		ug/L		96	70 - 125
trans-1,2-Dichloroethene	10.0	10.0		ug/L		100	74 - 130
Trichloroethene	10.0	8.98		ug/L		90	71 - 121
Vinyl chloride	10.0	9.95		ug/L		100	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*107*		*75 - 130*
4-Bromofluorobenzene (Surr)	*94*		*47 - 134*
Toluene-d8 (Surr)	*105*		*69 - 122*
Dibromofluoromethane (Surr)	*88*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-499882/4
Matrix: Water
Analysis Batch: 499882

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/17/21 15:23	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*66 - 120*		*08/17/21 15:23*	*1*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-499882/3
Matrix: Water
Analysis Batch: 499882

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	9.86		ug/L		99	80 - 122		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154453-1

GC/MS VOA

Analysis Batch: 499824

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154453-1	TRIP BLANK_71	Total/NA	Water	8260B	
240-154453-2	MW-106S_081121	Total/NA	Water	8260B	
MB 240-499824/7	Method Blank	Total/NA	Water	8260B	
LCS 240-499824/4	Lab Control Sample	Total/NA	Water	8260B	

Analysis Batch: 499882

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154453-2	MW-106S_081121	Total/NA	Water	8260B SIM	
MB 240-499882/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-499882/3	Lab Control Sample	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154453-1

Client Sample ID: TRIP BLANK_71

Lab Sample ID: 240-154453-1

Date Collected: 08/11/21 00:00

Matrix: Water

Date Received: 08/13/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	499824	08/17/21 14:10	LEE	TAL CAN

Client Sample ID: MW-106S_081121

Lab Sample ID: 240-154453-2

Date Collected: 08/11/21 13:19

Matrix: Water

Date Received: 08/13/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	499824	08/17/21 14:32	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	499882	08/18/21 00:28	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154453-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Andrew Barritt		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30080642.402.04	Shipping/Tracking No:		
PO # 30080642.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT ... 10 day ... 3 weeks, 2 weeks, 1 week, day, 1 day

Analyses

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 71		--		X						1							X	X	X	X	X	X	X	1 Trip Blank
MW-1065_081121	8/11/21	1319		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-154453 Chain of Custody

Possible Hazard Identification: Non-Hazard, Flammable, Irritant, Poison B, Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client, Disposal By Lab, Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com Cadena #E20363
Level IV Reporting requested

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
[signature]	Arcadis	8/11/21 1600	Novi Cold storage	Arcadis	8/11/21 1600
[signature]	Arcadis	8/12/21 1005	[signature]	ETA	8/12/21 1000
[signature]	ETA	8/12/21 1330	Received in Laboratory by: [signature]	Company: ETA	Date/Time: 8-13-21 0800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 154453**
Canton Facility

Client Arcadis Site Name

Cooler Received on 8-13-21 Opened on 8-13-21

Cooler unpacked by Brandon

FedEx 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used ~~Bubble Wrap~~ Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp 0.4 °C Corrected Cooler Temp 0.5 °C

IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp ____ °C Corrected Cooler Temp ____ °C

2	Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
	-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
	-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
	-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3	Shippers packing slip attached to the cooler(s)?	Yes	No
4	Did custody papers accompany the sample(s)?	Yes	No
5	Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6	Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7	Did all bottles arrive in good condition (Unbroken)?	Yes	No
8	Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9	For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10	Were correct bottle(s) used for the test(s) indicated?	Yes	No
11	Sufficient quantity received to perform indicated analyses?	Yes	No
12	Are these work share samples and all listed on the COC?	Yes	No
	If yes, Questions 13-17 have been checked at the originating laboratory		
13	Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC157842
14	Were VOAs on the COC?	Yes	No
15	Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	No NA
16	Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ____	Yes	No
17	Was a LL Hg or Me Hg trip blank present? ____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by

The TB is not logged for SIM per PM, ged 8-16-21

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired

Sample(s) ____ were received in a broken container

Sample(s) ____ were received with bubble >6 mm in diameter (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory

Time preserved ____ Preservative(s) added/Lot number(s) ____

VOA Sample Preservation - Date/Time VOAs Frozen ____

WI-NC-099

DATA VERIFICATION REPORT

August 28, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04_W01 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 154453-1
Sample date: 2021-08-11
Report received by CADENA: 2021-08-27
Initial Data Verification completed by CADENA: 2021-08-28
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC and SIM QC batch MS/MSD issues as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

MBK/TBK - GCMS VOC QC batch 499824 method blank and trip blank had a detection below the RL for the following analyte: CIS-1,2-DICHLOROETHENE. The following client sample results should be considered to be non-detect at the RL and qualified with UB flags: -002.

SUR - GCMS VOC samples -001 and -002 surrogate recoveries were outliers biased high for 1 out of 4 surrogates. These client sample results should be considered to be estimated and qualified with J flags if detected. Non-detect results do not require qualification.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 154453-1

		Sample Name:	TRIP BLANK_71				MW-106S_081121			
		Lab Sample ID:	2401544531				2401544532			
		Sample Date:	8/11/2021				8/11/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	0.83	1.0	ug/l	J	0.78	1.0	ug/l	UB
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Qualified Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 154453-1

		Sample Name:	TRIP BLANK_71				MW-106S_081121			
		Lab Sample ID:	2401544531				2401544532			
		Sample Date:	8/11/2021				8/11/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
cis-1,2-Dichloroethene	156-59-2	0.83	1.0	ug/l	J	0.78	1.0	ug/l	UB

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

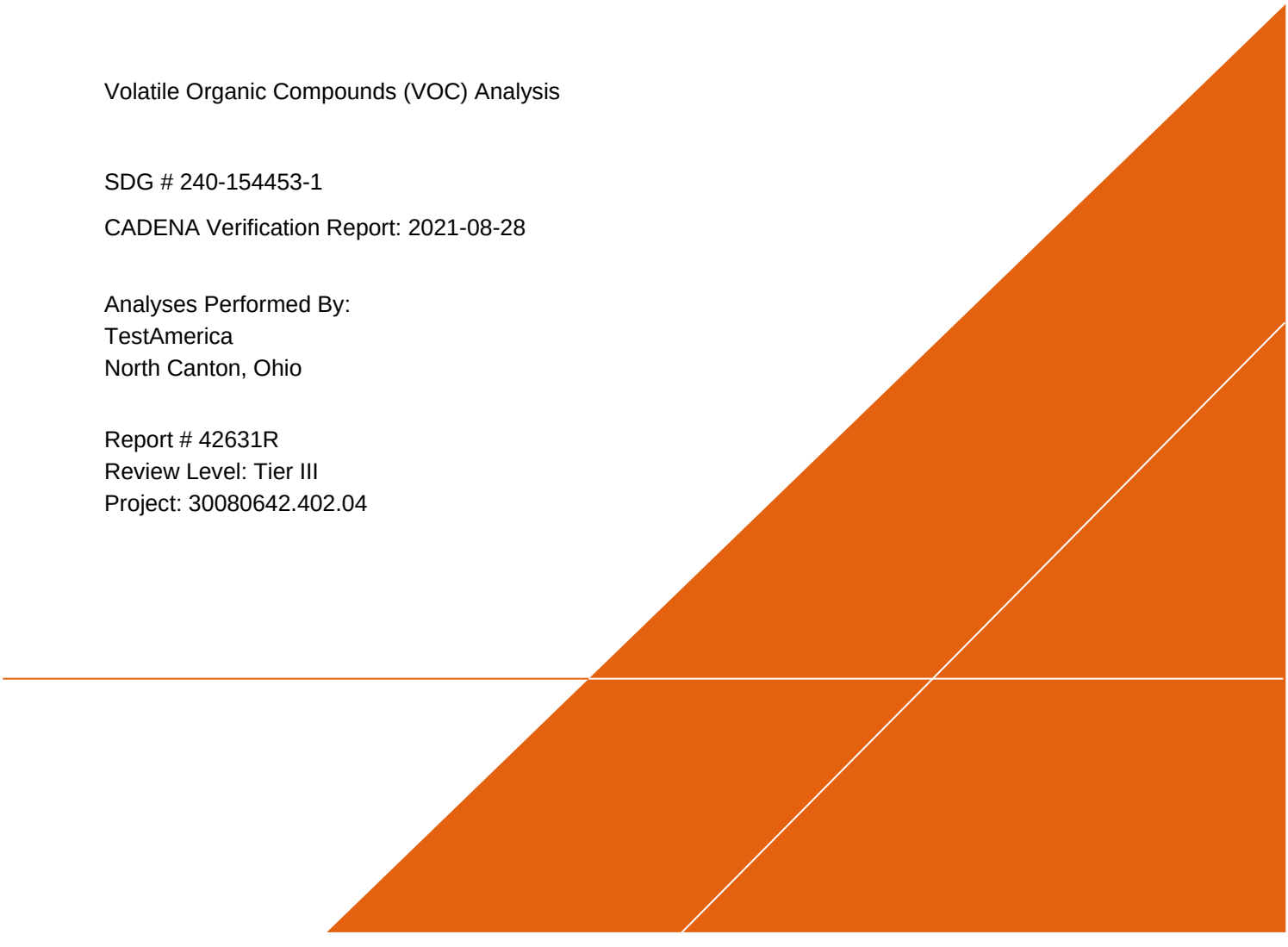
Volatile Organic Compounds (VOC) Analysis

SDG # 240-154453-1

CADENA Verification Report: 2021-08-28

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 42631R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-154453-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_71	240-154453-1	Water	08/11/21		X	
MW-106S_081121	240-154453-2	Water	08/11/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Compound	Criteria
TRIP BLANK_71 MW-106S_081121	Continuous Calibration Verification %D	cis-1,2-Dichloroethene	+37.0%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	

Initial/Continuing	Criteria	Sample Result	Qualification
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

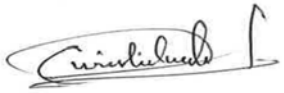
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: September 15, 2021

PEER REVIEW: Andrew Korycinski

DATE: September 16, 2021

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190

Client Contact	Regulatory program: DW NPDES RCRA Other			TestAmerica Laboratories, Inc.
Company Name: Arcadis				COC No:
Address: 28550 Cabot Drive, Suite 500	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	
City/State/Zip: Novi, MI 48377	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Phone: 248-994-2240	Email: kristoffer.hinskey@arcadis.com			For lab use only
Project Name: Ford LTP Off-Site	Sampler Name: Andrew Barritt	Analysis Turnaround Time: TAT (Different from below) 10 day; 3 weeks, 2 weeks, 1 week, day, 1 day		Walk-in client
Project Number: 30080642.402.04	Method of Shipment/Carrier:			Lab sampling
PO # 30080642.402.04	Shipping/Tracking No:			Job/SDG No:

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 71		--		X						1							X	X	X	X	X	X	X	1 Trip Blank
MW-1065-081121	8/11/21	1319		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-154453 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; ✓ Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com Cadena #E20363
Level IV Reporting requested

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
[signature]	Arcadis	8/11/21 1600	Novi Cold storage	Arcadis	8/11/21 1600
[signature]	Arcadis	8/12/21 1005	[signature]	ETA	8/12/21 1006
[signature]	ETA	8/12/21 1330	Received in Laboratory by: [signature]	Company: ETA	Date/Time: 8-13-21 0800

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Client Sample ID: TRIP BLANK_71
Lab Sample ID: 240-154453-1
Date Collected: 08/11/21 00:00
Matrix: Water
Date Received: 08/13/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/17/21 14:10	1
cis-1,2-Dichloroethene	**0.83**	~~J B~~ J	1.0	0.46	ug/L			08/17/21 14:10	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/17/21 14:10	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/17/21 14:10	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/17/21 14:10	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/17/21 14:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*132*	*S1+*	*75 - 130*		*08/17/21 14:10*	*1*
4-Bromofluorobenzene (Surr)	*66*		*47 - 134*		*08/17/21 14:10*	*1*
Toluene-d8 (Surr)	*91*		*69 - 122*		*08/17/21 14:10*	*1*
Dibromofluoromethane (Surr)	*106*		*78 - 129*		*08/17/21 14:10*	*1*

Client Sample ID: MW-106S_081121
Lab Sample ID: 240-154453-2
Date Collected: 08/11/21 13:19
Matrix: Water
Date Received: 08/13/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/18/21 00:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*66 - 120*		*08/18/21 00:28*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/17/21 14:32	1
cis-1,2-Dichloroethene	~~0.78 J B~~		1.0 UBJ	0.46	ug/L			08/17/21 14:32	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/17/21 14:32	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/17/21 14:32	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/17/21 14:32	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/17/21 14:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*134*	*S1+*	*75 - 130*		*08/17/21 14:32*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*08/17/21 14:32*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*08/17/21 14:32*	*1*
Dibromofluoromethane (Surr)	*107*		*78 - 129*		*08/17/21 14:32*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-154633-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
8/31/2021 10:01:09 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154633-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154633-1

Job ID: 240-154633-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-154633-1

Comments
No additional comments.

Receipt
The samples were received on 8/17/2021 10:40 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 4.2º C and 4.7º C.

GC/MS VOA
Method 8260B: There was an MS/MSD analyzed in batch 240-500017 but could not be reported because the associated sample needed reanalyzed in a different batch: TRIP BLANK_100 (240-154633-1) and MW-107S_081321 (240-154633-2).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154633-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154633-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-154633-1	TRIP BLANK_100	Water	08/13/21 00:00	08/17/21 10:40
240-154633-2	MW-107S_081321	Water	08/13/21 10:55	08/17/21 10:40

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154633-1

Client Sample ID: TRIP BLANK_100 — Lab Sample ID: 240-154633-1

No Detections.

Client Sample ID: MW-107S_081321 — Lab Sample ID: 240-154633-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154633-1

Client Sample ID: TRIP BLANK_100
Date Collected: 08/13/21 00:00
Date Received: 08/17/21 10:40

Lab Sample ID: 240-154633-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/18/21 19:41	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/18/21 19:41	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/18/21 19:41	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/18/21 19:41	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/18/21 19:41	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/18/21 19:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*		*08/18/21 19:41*	*1*
4-Bromofluorobenzene (Surr)	*116*		*56 - 136*		*08/18/21 19:41*	*1*
Toluene-d8 (Surr)	*99*		*78 - 122*		*08/18/21 19:41*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*08/18/21 19:41*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154633-1

Client Sample ID: MW-107S_081321
Date Collected: 08/13/21 10:55
Date Received: 08/17/21 10:40

Lab Sample ID: 240-154633-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/21/21 05:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*08/21/21 05:09*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/18/21 20:04	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/18/21 20:04	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/18/21 20:04	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/18/21 20:04	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/18/21 20:04	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/18/21 20:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*62 - 137*		*08/18/21 20:04*	*1*
4-Bromofluorobenzene (Surr)	*112*		*56 - 136*		*08/18/21 20:04*	*1*
Toluene-d8 (Surr)	*97*		*78 - 122*		*08/18/21 20:04*	*1*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*08/18/21 20:04*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154633-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-154633-1	TRIP BLANK_100	86	116	99	95
240-154633-2	MW-107S_081321	84	112	97	91
LCS 240-500017/4	Lab Control Sample	85	116	100	97
MB 240-500017/7	Method Blank	82	114	101	91

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-154633-2	MW-107S_081321	83
240-154644-L-3 MS	Matrix Spike	84
240-154644-Q-3 MSD	Matrix Spike Duplicate	87
LCS 240-500493/3	Lab Control Sample	85
MB 240-500493/4	Method Blank	85

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-500017/7
Matrix: Water
Analysis Batch: 500017

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/18/21 16:31	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/18/21 16:31	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/18/21 16:31	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/18/21 16:31	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/18/21 16:31	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/18/21 16:31	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*62 - 137*		*08/18/21 16:31*	*1*
4-Bromofluorobenzene (Surr)	*114*		*56 - 136*		*08/18/21 16:31*	*1*
Toluene-d8 (Surr)	*101*		*78 - 122*		*08/18/21 16:31*	*1*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*08/18/21 16:31*	*1*

Lab Sample ID: LCS 240-500017/4
Matrix: Water
Analysis Batch: 500017

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.69		ug/L		97	63 - 134
cis-1,2-Dichloroethene	10.0	9.72		ug/L		97	77 - 123
Tetrachloroethene	10.0	9.24		ug/L		92	76 - 123
trans-1,2-Dichloroethene	10.0	9.81		ug/L		98	75 - 124
Trichloroethene	10.0	9.42		ug/L		94	70 - 122
Vinyl chloride	10.0	10.8		ug/L		108	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*62 - 137*
4-Bromofluorobenzene (Surr)	*116*		*56 - 136*
Toluene-d8 (Surr)	*100*		*78 - 122*
Dibromofluoromethane (Surr)	*97*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-500493/4
Matrix: Water
Analysis Batch: 500493

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/20/21 22:07	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*08/20/21 22:07*	*1*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-500493/3
Matrix: Water
Analysis Batch: 500493

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.2		ug/L		102	80 - 122		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

Lab Sample ID: 240-154644-L-3 MS
Matrix: Water
Analysis Batch: 500493

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	9.72		ug/L		97	51 - 153		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*

Lab Sample ID: 240-154644-Q-3 MSD
Matrix: Water
Analysis Batch: 500493

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.0		ug/L		100	51 - 153	3	16

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154633-1

GC/MS VOA

Analysis Batch: 500017

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154633-1	TRIP BLANK_100	Total/NA	Water	8260B	
240-154633-2	MW-107S_081321	Total/NA	Water	8260B	
MB 240-500017/7	Method Blank	Total/NA	Water	8260B	
LCS 240-500017/4	Lab Control Sample	Total/NA	Water	8260B	

Analysis Batch: 500493

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154633-2	MW-107S_081321	Total/NA	Water	8260B SIM	
MB 240-500493/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-500493/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-154644-L-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-154644-Q-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154633-1

Client Sample ID: TRIP BLANK_100

Lab Sample ID: 240-154633-1

Date Collected: 08/13/21 00:00

Matrix: Water

Date Received: 08/17/21 10:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	500017	08/18/21 19:41	LRW	TAL CAN

Client Sample ID: MW-107S_081321

Lab Sample ID: 240-154633-2

Date Collected: 08/13/21 10:55

Matrix: Water

Date Received: 08/17/21 10:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	500017	08/18/21 20:04	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	500493	08/21/21 05:09	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154633-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

MICHIGAN 190

TestAmerica

TestAmerica Laboratory location. Brighton — 10448 Citation Drive Suite 200 Brighton, MI 48116 / 810-229-2763

Regulatory program DW NPDES RCRA Other

Client Contact

Company Name: Arcadis
Address: 28550 Cabot Drive, Suite 500
City/State/Zip: Novi, MI, 48377
Phone: 248-994-2240
Project Name Ford LTP Off-Site
Project Number: 30080642.402.04
PO # 30080642.402.04

Client Project Manager: Kris Hinskey
Telephone 248-994-2240
Email: kristoffer.hinskey@arcadis.com
Sampler Name: Andrew Barritt
Method of Shipment/Carrier:
Shipping/Tracking No:

Site Contact: Julia McClafferty
Telephone: 734-644-5131

Lab Contact: Mike DelMonico
Telephone: 330-497-9396

TestAmerica Laboratories, Inc.
COC No:
1 of 1 COCs
For lab use only
Walk-in client
Lab sampling
Job/SDG No:

Analysis Turnaround Time
TAT di ent from low
10 day ✓ 3 weeks / weeks / 1 week / 2 days / 1 day

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc NaOH	Unpres	Other	Filtered Sample (Y/N)	Composite=C/Grab=G	1 1-DCE 8260B	cis-1 2-DCE 8260B	Trans-1 2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM					Sample Specific Notes Special Instructions:
✓ TRIP BLANK_100	--			X						1							X	X	X	X	X	X	X					1 Trip Blank
✓ MW-1075-081321	8/13/21	1055		X						6					N	G	X	X	X	X	X	X	X					3 VOAs for 8260B 3 VOAs for 8260B SIM

240-154633 Chain of Custody

Possible Hazard Identification
✓ Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Return to Client ✓ Disposal By Lab Archive For Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalla@cadenaco.com. Cadena #E20363
Level IV Reporting requested

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	8/13/21 1500	Nov cold storage	Arcadis	8/13/21 1500
[signature]	Arcadis	8/16/21 954	[signature]	ETA	8/16/21 954
[signature]	ETA	8/16/21 1418	Received in Laboratory by: [signature]	ETA	8-17-21 1040

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login #** 154633
Canton Facility

Client Arcadis Site Name

Cooler unpacked by Justin H

Cooler Received on 6-17-21 Opened on 6-17-21

FedEx 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt ☒ See Multiple Cooler Form

IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp ____°C Corrected Cooler Temp ____°C

IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp ____°C Corrected Cooler Temp ____°C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No	
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No	NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No	
-Were tamper/custody seals intact and uncompromised?	Yes	No	NA
3 Shippers' packing slip attached to the cooler(s)?	Yes	No	
4 Did custody papers accompany the sample(s)?	Yes	No	
5 Were the custody papers relinquished & signed in the appropriate place?	Yes	No	
6 Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No	
7 Did all bottles arrive in good condition (Unbroken)?	Yes	No	
8 Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No	
9 For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?			
10 Were correct bottle(s) used for the test(s) indicated? 6/18-21	Yes	No	
11 Sufficient quantity received to perform indicated analyses?	Yes	No	
12 Are these work share samples and all listed on the COC?	Yes	No	
If yes, Questions 13-17 have been checked at the originating laboratory			
13 Were all preserved sample(s) at the correct pH upon receipt?	Yes	No	NA pH Strip Lot# HC157842
14 Were VOAs on the COC?	Yes	No	
15 Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No	NA
16 Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # covered	Yes	No	
17 Was a LL Hg or Me Hg trip blank present? ____	Yes	No	

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by

TB not to be analyzed for 8260-Sim

19 SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired

Sample(s) ____ were received in a broken container

Sample(s) ____ were received with bubble >6 mm in diameter (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory

Time preserved ____ Preservative(s) added/Lot number(s) ____

VOA Sample Preservation - Date/Time VOAs Frozen. ____

WI-NC-099

Login # : 154633

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form				
Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
(TA) Client Box Other	(IR-1) IR-12	4.1	4.2	(Wet Ice) Blue Ice Dry Ice Water None
(TA) Client Box Other	(IR-1) IR 12	4.6"	4.7	(Wet Ice) Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR 11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR 11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-

DATA VERIFICATION REPORT

August 31, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04_W01 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 154633-1
Sample date: 2021-08-13
Report received by CADENA: 2021-08-31
Initial Data Verification completed by CADENA: 2021-08-31
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch MS/MSD issues as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 154633-1

		Sample Name:	TRIP BLANK_100				MW-107S_081321			
		Lab Sample ID:	2401546331				2401546332			
		Sample Date:	8/13/2021				8/13/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

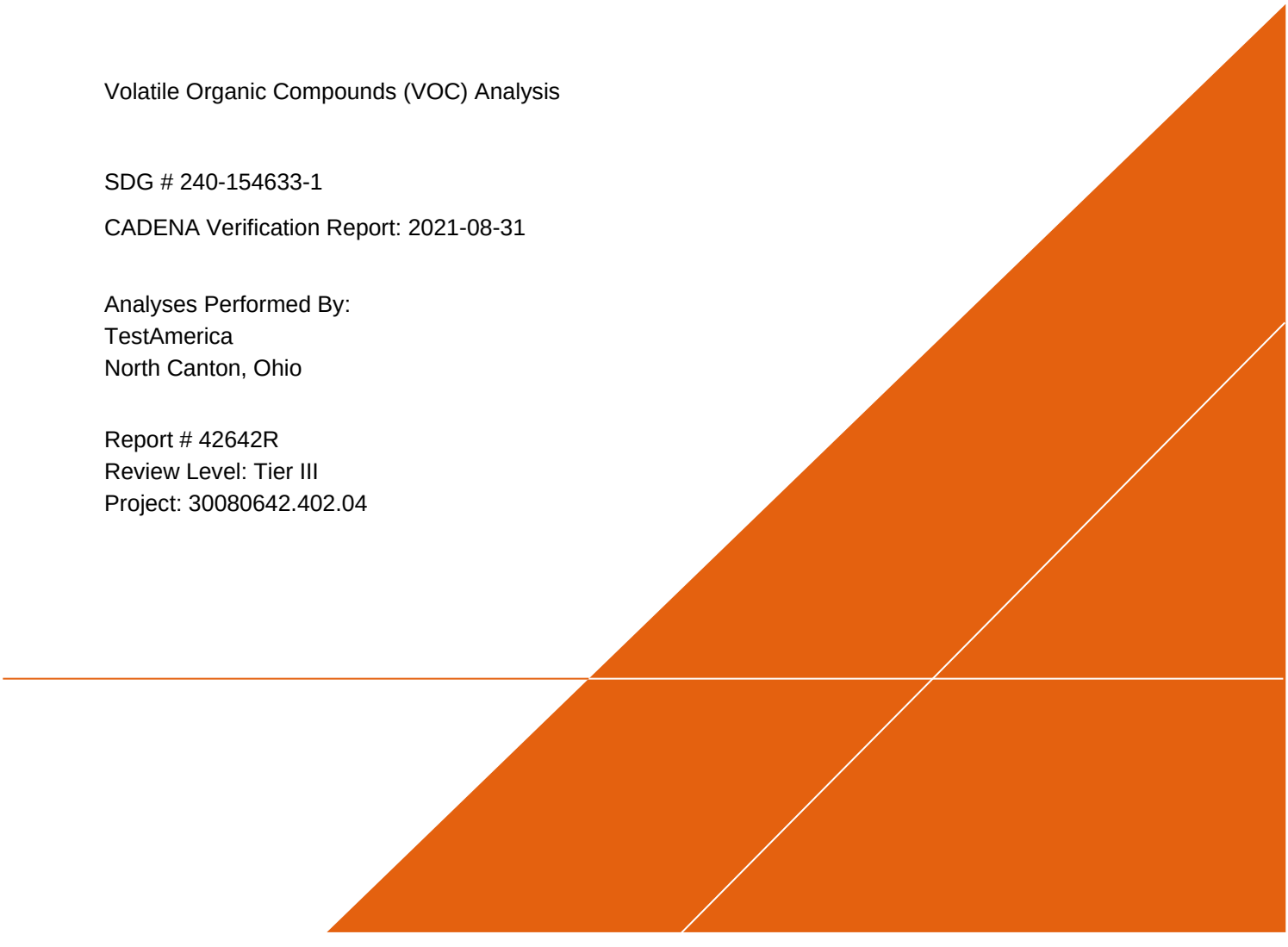
Volatile Organic Compounds (VOC) Analysis

SDG # 240-154633-1

CADENA Verification Report: 2021-08-31

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 42642R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-154633-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_100	240-154633-1	Water	08/13/21		X	
MW-107S_081321	240-154633-2	Water	08/13/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

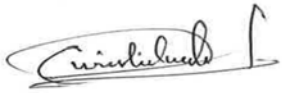
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: September 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: September 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive Suite 200 Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No: 1 of 1 COCs
Phone: 248-994-2240	Sampler Name: Andrew Barth	TAT different from below: 10 day ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day	For lab use only: Walk-in client; Lab sampling; Job/SDG No:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30080642.402.04	Shipping/Tracking No:		
PO # 30080642.402.04			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y/N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_100	--			X						1							X	X	X	X	X	X	X	1 Trip Blank
MW-1075-081321	8/13/21	1055		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-154633 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalla@cadenaco.com. Cadena #E20363
Level IV Reporting requested

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
Andrew Barth	Arcadis	8/13/21 1500	Non cold storage	Arcadis	8/13/21 1500
Relinquished by	Company	Date/Time	Received by	Company	Date/Time
Christopher Bracco	Arcadis	8/16/21 954	Chris Pathman	ETA	8/16/21 954
Relinquished by	Company	Date/Time	Received in Laboratory by	Company	Date/Time:
Chris Pathman	ETA	8/16/21 1418	GH	ETA	8-17-21 1040

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Client Sample ID: TRIP BLANK_100
Lab Sample ID: 240-154633-1
Date Collected: 08/13/21 00:00
Matrix: Water
Date Received: 08/17/21 10:40

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/18/21 19:41	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/18/21 19:41	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/18/21 19:41	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/18/21 19:41	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/18/21 19:41	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/18/21 19:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*		*08/18/21 19:41*	*1*
4-Bromofluorobenzene (Surr)	*116*		*56 - 136*		*08/18/21 19:41*	*1*
Toluene-d8 (Surr)	*99*		*78 - 122*		*08/18/21 19:41*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*08/18/21 19:41*	*1*

Client Sample ID: MW-107S_081321
Lab Sample ID: 240-154633-2
Date Collected: 08/13/21 10:55
Matrix: Water
Date Received: 08/17/21 10:40

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/21/21 05:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*08/21/21 05:09*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/18/21 20:04	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/18/21 20:04	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/18/21 20:04	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/18/21 20:04	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/18/21 20:04	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/18/21 20:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*62 - 137*		*08/18/21 20:04*	*1*
4-Bromofluorobenzene (Surr)	*112*		*56 - 136*		*08/18/21 20:04*	*1*
Toluene-d8 (Surr)	*97*		*78 - 122*		*08/18/21 20:04*	*1*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*08/18/21 20:04*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-154642-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
8/31/2021 10:04:32 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154642-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
F2	MS/MSD RPD exceeds control limits
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-154642-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-154642-1

Comments
No additional comments.

Receipt
The samples were received on 8/17/2021 10:40 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 4.2º C and 4.7º C.

GC/MS VOA
Method 8260B: The MS/MSD for batch 240-500229 was not analyzed due to an instrument malfunction: TRIP BLANK_85 (240-154642-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154642-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154642-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-154642-1	TRIP BLANK_85	Water	08/13/21 00:00	08/17/21 10:40
240-154642-2	MW-142S_081321	Water	08/13/21 12:30	08/17/21 10:40
240-154642-3	MW-132S_081321	Water	08/13/21 14:30	08/17/21 10:40
240-154642-4	DUP-06	Water	08/13/21 00:00	08/17/21 10:40

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154642-1

Client Sample ID: TRIP BLANK_85 — Lab Sample ID: 240-154642-1

No Detections.

Client Sample ID: MW-142S_081321 — Lab Sample ID: 240-154642-2

No Detections.

Client Sample ID: MW-132S_081321 — Lab Sample ID: 240-154642-3

No Detections.

Client Sample ID: DUP-06 — Lab Sample ID: 240-154642-4

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154642-1

Client Sample ID: TRIP BLANK_85

Date Collected: 08/13/21 00:00
Date Received: 08/17/21 10:40

Lab Sample ID: 240-154642-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/19/21 18:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/19/21 18:44	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/19/21 18:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/19/21 18:44	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/19/21 18:44	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/19/21 18:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*62 - 137*		*08/19/21 18:44*	*1*
4-Bromofluorobenzene (Surr)	*114*		*56 - 136*		*08/19/21 18:44*	*1*
Toluene-d8 (Surr)	*99*		*78 - 122*		*08/19/21 18:44*	*1*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*08/19/21 18:44*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154642-1

Client Sample ID: MW-142S_081321
Date Collected: 08/13/21 12:30
Date Received: 08/17/21 10:40

Lab Sample ID: 240-154642-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/21/21 07:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*08/21/21 07:38*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/23/21 15:30	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/23/21 15:30	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/23/21 15:30	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/23/21 15:30	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/23/21 15:30	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/23/21 15:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*62 - 137*		*08/23/21 15:30*	*1*
4-Bromofluorobenzene (Surr)	*116*		*56 - 136*		*08/23/21 15:30*	*1*
Toluene-d8 (Surr)	*102*		*78 - 122*		*08/23/21 15:30*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*08/23/21 15:30*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154642-1

Client Sample ID: MW-132S_081321
Date Collected: 08/13/21 14:30
Date Received: 08/17/21 10:40

Lab Sample ID: 240-154642-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/21/21 08:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*08/21/21 08:03*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/23/21 15:54	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/23/21 15:54	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/23/21 15:54	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/23/21 15:54	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/23/21 15:54	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/23/21 15:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*62 - 137*		*08/23/21 15:54*	*1*
4-Bromofluorobenzene (Surr)	*118*		*56 - 136*		*08/23/21 15:54*	*1*
Toluene-d8 (Surr)	*102*		*78 - 122*		*08/23/21 15:54*	*1*
Dibromofluoromethane (Surr)	*97*		*73 - 120*		*08/23/21 15:54*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154642-1

Client Sample ID: DUP-06
Date Collected: 08/13/21 00:00
Date Received: 08/17/21 10:40

Lab Sample ID: 240-154642-4
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/21/21 08:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*08/21/21 08:28*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/23/21 16:17	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/23/21 16:17	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/23/21 16:17	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/23/21 16:17	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/23/21 16:17	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/23/21 16:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*		*08/23/21 16:17*	*1*
4-Bromofluorobenzene (Surr)	*117*		*56 - 136*		*08/23/21 16:17*	*1*
Toluene-d8 (Surr)	*101*		*78 - 122*		*08/23/21 16:17*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*08/23/21 16:17*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154642-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-154642-1	TRIP BLANK_85	84	114	99	91
240-154642-2	MW-142S_081321	83	116	102	98
240-154642-3	MW-132S_081321	87	118	102	97
240-154642-4	DUP-06	86	117	101	96
240-154644-G-3 MS	Matrix Spike	84	118	101	99
240-154644-H-3 MSD	Matrix Spike Duplicate	85	114	98	99
LCS 240-500229/4	Lab Control Sample	85	118	100	99
LCS 240-500635/4	Lab Control Sample	83	116	103	100
MB 240-500229/7	Method Blank	84	114	99	94
MB 240-500635/7	Method Blank	83	116	100	95

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-154642-2	MW-142S_081321	83
240-154642-3	MW-132S_081321	83
240-154642-4	DUP-06	85
240-154644-L-3 MS	Matrix Spike	84
240-154644-Q-3 MSD	Matrix Spike Duplicate	87
LCS 240-500493/3	Lab Control Sample	85
MB 240-500493/4	Method Blank	85

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-500229/7
Matrix: Water
Analysis Batch: 500229

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/19/21 14:47	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/19/21 14:47	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/19/21 14:47	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/19/21 14:47	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/19/21 14:47	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/19/21 14:47	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*62 - 137*		*08/19/21 14:47*	*1*
4-Bromofluorobenzene (Surr)	*114*		*56 - 136*		*08/19/21 14:47*	*1*
Toluene-d8 (Surr)	*99*		*78 - 122*		*08/19/21 14:47*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*08/19/21 14:47*	*1*

Lab Sample ID: LCS 240-500229/4
Matrix: Water
Analysis Batch: 500229

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	11.1		ug/L		111	63 - 134
cis-1,2-Dichloroethene	10.0	10.4		ug/L		104	77 - 123
Tetrachloroethene	10.0	9.94		ug/L		99	76 - 123
trans-1,2-Dichloroethene	10.0	10.6		ug/L		106	75 - 124
Trichloroethene	10.0	10.0		ug/L		100	70 - 122
Vinyl chloride	10.0	10.8		ug/L		108	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*62 - 137*
4-Bromofluorobenzene (Surr)	*118*		*56 - 136*
Toluene-d8 (Surr)	*100*		*78 - 122*
Dibromofluoromethane (Surr)	*99*		*73 - 120*

Lab Sample ID: MB 240-500635/7
Matrix: Water
Analysis Batch: 500635

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/23/21 14:42	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/23/21 14:42	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/23/21 14:42	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/23/21 14:42	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/23/21 14:42	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/23/21 14:42	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*62 - 137*		*08/23/21 14:42*	*1*
4-Bromofluorobenzene (Surr)	*116*		*56 - 136*		*08/23/21 14:42*	*1*
Toluene-d8 (Surr)	*100*		*78 - 122*		*08/23/21 14:42*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 240-500635/7
Matrix: Water
Analysis Batch: 500635

Client Sample ID: Method Blank
Prep Type: Total/NA

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	95		73 - 120		08/23/21 14:42	1

Lab Sample ID: LCS 240-500635/4
Matrix: Water
Analysis Batch: 500635

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,1-Dichloroethene			10.0	10.8		ug/L		108	63 - 134		
cis-1,2-Dichloroethene			10.0	10.3		ug/L		103	77 - 123		
Tetrachloroethene			10.0	10.1		ug/L		101	76 - 123		
trans-1,2-Dichloroethene			10.0	10.5		ug/L		105	75 - 124		
Trichloroethene			10.0	10.1		ug/L		101	70 - 122		
Vinyl chloride			10.0	9.65		ug/L		96	60 - 144		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	83		62 - 137
4-Bromofluorobenzene (Surr)	116		56 - 136
Toluene-d8 (Surr)	103		78 - 122
Dibromofluoromethane (Surr)	100		73 - 120

Lab Sample ID: 240-154644-G-3 MS
Matrix: Water
Analysis Batch: 500635

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,1-Dichloroethene	1.0	U	10.0	6.83		ug/L		68	56 - 135		
cis-1,2-Dichloroethene	0.59	J	10.0	9.05		ug/L		85	66 - 128		
Tetrachloroethene	1.0	U F2 F1	10.0	2.91	F1	ug/L		29	62 - 131		
trans-1,2-Dichloroethene	1.0	U	10.0	7.24		ug/L		72	56 - 136		
Trichloroethene	1.0	U F2 F1	10.0	5.21	F1	ug/L		52	61 - 124		
Vinyl chloride	1.0	U	10.0	8.56		ug/L		86	43 - 157		

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	84		62 - 137
4-Bromofluorobenzene (Surr)	118		56 - 136
Toluene-d8 (Surr)	101		78 - 122
Dibromofluoromethane (Surr)	99		73 - 120

Lab Sample ID: 240-154644-H-3 MSD
Matrix: Water
Analysis Batch: 500635

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	7.70		ug/L		77	56 - 135	12	26
cis-1,2-Dichloroethene	0.59	J	10.0	9.45		ug/L		89	66 - 128	4	14
Tetrachloroethene	1.0	U F2 F1	10.0	3.72	F2 F1	ug/L		37	62 - 131	25	20
trans-1,2-Dichloroethene	1.0	U	10.0	8.10		ug/L		81	56 - 136	11	15
Trichloroethene	1.0	U F2 F1	10.0	6.13	F2	ug/L		61	61 - 124	16	15

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-154644-H-3 MSD
Matrix: Water
Analysis Batch: 500635

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Vinyl chloride	1.0	U	10.0	8.89		ug/L		89	43 - 157	4	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*62 - 137*
4-Bromofluorobenzene (Surr)	*114*		*56 - 136*
Toluene-d8 (Surr)	*98*		*78 - 122*
Dibromofluoromethane (Surr)	*99*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-500493/4
Matrix: Water
Analysis Batch: 500493

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/20/21 22:07	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*08/20/21 22:07*	*1*

Lab Sample ID: LCS 240-500493/3
Matrix: Water
Analysis Batch: 500493

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.2		ug/L		102	80 - 122		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

Lab Sample ID: 240-154644-L-3 MS
Matrix: Water
Analysis Batch: 500493

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	9.72		ug/L		97	51 - 153		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*

Lab Sample ID: 240-154644-Q-3 MSD
Matrix: Water
Analysis Batch: 500493

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.0		ug/L		100	51 - 153	3	16

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-154644-Q-3 MSD
Matrix: Water
Analysis Batch: 500493

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154642-1

GC/MS VOA

Analysis Batch: 500229

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154642-1	TRIP BLANK_85	Total/NA	Water	8260B	
MB 240-500229/7	Method Blank	Total/NA	Water	8260B	
LCS 240-500229/4	Lab Control Sample	Total/NA	Water	8260B	

Analysis Batch: 500493

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154642-2	MW-142S_081321	Total/NA	Water	8260B SIM	
240-154642-3	MW-132S_081321	Total/NA	Water	8260B SIM	
240-154642-4	DUP-06	Total/NA	Water	8260B SIM	
MB 240-500493/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-500493/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-154644-L-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-154644-Q-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 500635

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154642-2	MW-142S_081321	Total/NA	Water	8260B	
240-154642-3	MW-132S_081321	Total/NA	Water	8260B	
240-154642-4	DUP-06	Total/NA	Water	8260B	
MB 240-500635/7	Method Blank	Total/NA	Water	8260B	
LCS 240-500635/4	Lab Control Sample	Total/NA	Water	8260B	
240-154644-G-3 MS	Matrix Spike	Total/NA	Water	8260B	
240-154644-H-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154642-1

Client Sample ID: TRIP BLANK_85

Lab Sample ID: 240-154642-1
Matrix: Water
Date Collected: 08/13/21 00:00
Date Received: 08/17/21 10:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	500229	08/19/21 18:44	LRW	TAL CAN

Client Sample ID: MW-142S_081321

Lab Sample ID: 240-154642-2
Matrix: Water
Date Collected: 08/13/21 12:30
Date Received: 08/17/21 10:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	500635	08/23/21 15:30	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	500493	08/21/21 07:38	CS	TAL CAN

Client Sample ID: MW-132S_081321

Lab Sample ID: 240-154642-3
Matrix: Water
Date Collected: 08/13/21 14:30
Date Received: 08/17/21 10:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	500635	08/23/21 15:54	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	500493	08/21/21 08:03	CS	TAL CAN

Client Sample ID: DUP-06

Lab Sample ID: 240-154642-4
Matrix: Water
Date Collected: 08/13/21 00:00
Date Received: 08/17/21 10:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	500635	08/23/21 16:17	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	500493	08/21/21 08:28	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154642-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

MICHIGAN 190

TestAmerica

TestAmerica Laboratory location Brighton --- 10448 Citation Drive, Suite 200 Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Emma Witherspoon		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30080642.402.04	Shipping/Tracking No:		
PO # 30080642.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT ... 10 day ☑ 3 weeks 2 weeks 1 week 2 days 1 day

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc NaOH	Unpres	Other	Filtered Sample (Y/N)	Composite=C/Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes Special Instructions:
TRIP BLANK_85				X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW 142S_081321	8/13/21	1230		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW 132S_081321	8/13/21	1430		X						6					N	G	X	X	X	X	X	X	X	
DUP 06	8/13/21	—		X						6					N	G	X	X	X	X	X	X	X	

240-154642 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Return to Client ☑ Disposal By Lab Archive For Months

Special Instructions/QC Requirements & Comments.

Submit all results through Cadena at jtomalia@cadenaco.com Cadena #E20363
Level IV Reporting requested

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
E Witherspoon	Arcadis	8/13/21 1545	Novi Cold Storage	Arcadis	8/13/21 1545
E Witherspoon	Arcadis	8/16/21 954	Amanda Batthal	ETA	8/16/21
Amanda Batthal	ETA	8/16/21 1418	Received in Laboratory by: Adam Garnett	ETA	8-17-21 1040

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 154642
Canton Facility

Client Arcadis Site Name

Cooler unpacked by Justin H

Cooler Received on 8-17-21 Opened on 8-17-21

FedEx 1st Grd (Exp) UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used (Bubble Wrap) Foam Plastic Bag None Other

COOLANT (Wet Ice) Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt ☒ See Multiple Cooler Form

IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp _____°C Corrected Cooler Temp _____°C

IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp _____°C Corrected Cooler Temp _____°C

2	Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
	-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
	-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
	-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3	Shippers' packing slip attached to the cooler(s)?	(Yes)	No
4	Did custody papers accompany the sample(s)?	(Yes)	No
5	Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6	Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7	Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8	Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9	For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10	Were correct bottle(s) used for the test(s) indicated? SR 8-18-21	(Yes)	No
11	Sufficient quantity received to perform indicated analyses?	(Yes)	No
12	Are these work share samples and all listed on the COC?	Yes	(No)
	If yes, Questions 13-17 have been checked at the originating laboratory		
13	Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# HC157842
14	Were VOAs on the COC?	(Yes)	No
15	Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	(No) NA
16	Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # covered	(Yes)	No
17	Was a LL Hg or Me Hg trip blank present? _____	Yes	(No)

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by

TB not to be analyzed for 8260-Sim

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired

Sample(s) _____ were received in a broken container

Sample(s) _____ were received with bubble >6 mm in diameter (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory

Time preserved _____ Preservative(s) added/Lot number(s) _____

VOA Sample Preservation - Date/Time VOAs Frozen _____

WI-NC-099

Login # : 154642

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form

Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
(TA) Client Box Other	(IR-1) IR-12	4.1	4.2	(Wet Ice) Blue Ice Dry Ice Water None
(TA) Client Box Other	(IR-1) IR-12	4.6	4.7	(Wet Ice) Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR 11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice Blue Ice Dry Ice Water None

☐ See Temperature Excursion Form

DATA VERIFICATION REPORT

August 31, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04_W01 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 154642-1
Sample date: 2021-08-13
Report received by CADENA: 2021-08-31
Initial Data Verification completed by CADENA: 2021-08-31
Number of Samples:4
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS V0C QC batch MS/MSD recovery outliers were not determined using a client sample so qualification was not required based on these sample-specific QC outliers.

GCMS VOC QC batch MS/MSD issues as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 154642-1

		Sample Name:	TRIP BLANK_85				MW-142S_081321				MW-132S_081321				DUP-06			
		Lab Sample ID:	2401546421				2401546422				2401546423				2401546424			
		Sample Date:	8/13/2021				8/13/2021				8/13/2021				8/13/2021			
	Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC																		
	OSW-8260B																	
	1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	OSW-8260BBSim																	
	1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

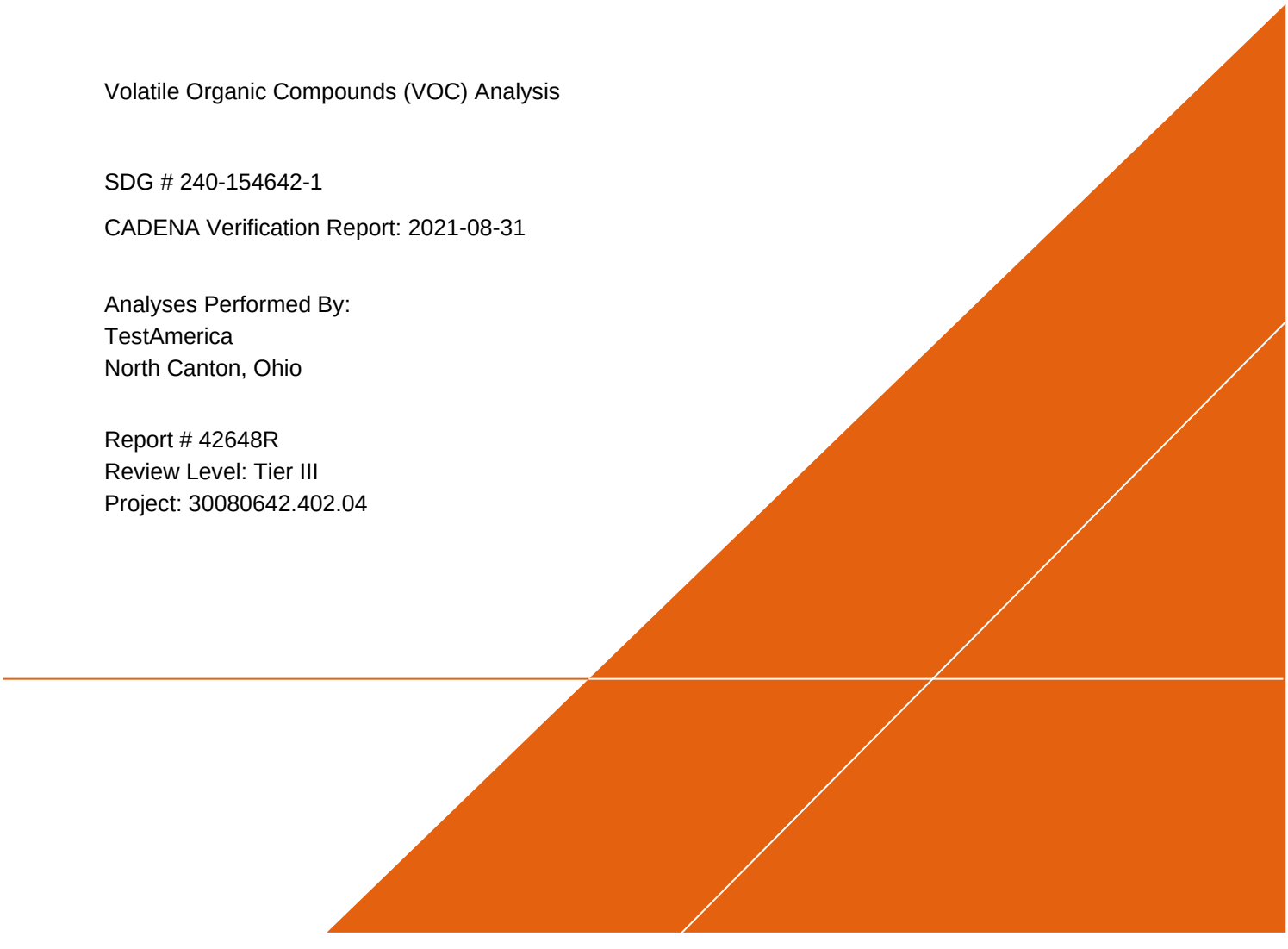
Volatile Organic Compounds (VOC) Analysis

SDG # 240-154642-1

CADENA Verification Report: 2021-08-31

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 42648R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-154642-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_85	240-154642-1	Water	08/13/21		X	
MW-142S_081321	240-154642-2	Water	08/13/21		X	X
MW-132S_081321	240-154642-3	Water	08/13/21	MW-142S_081321	X	X
DUP-06	240-154642-4	Water	08/13/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result (µg/L)	Duplicate Result (µg/L)	RPD
MW-142S_081221 / DUP-07	All target compounds	U	U	AC

Notes:

U – Non detect

AC – Acceptable

The calculated differences between the parent sample and field duplicate were acceptable.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

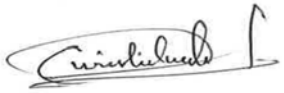
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: September 20, 2021

PEER REVIEW: Andrew Korycinski

DATE: September 21, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190

TestAmerica

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Emma Witherspoon	TAT (if different from below)		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:	10 day	3 weeks / 2 weeks / 1 week / 2 days / 1 day	Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 65				X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW 1425_081321	8/13/21	1230		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B
MW 1325_081321	8/13/21	1430		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B SIM
DUP 06	8/13/21	—		X						6					N	G	X	X	X	X	X	X	X	

240-154642 Chain of Custody

Possible Hazard Identification: Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / Disposal By Lab / Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com Cadena #E20363
Level IV Reporting requested

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
Elutherspoon	Arcadis	8/13/21 1545	NOVI Gold Storage	Arcadis	8/13/21 1545
Relinquished by: Elutherspoon	Company: Arcadis	Date/Time: 8/16/21 954	Received by:	Company: ETA	Date/Time: 8/16/21
Relinquished by: Amanda Bathel	Company: ETA	Date/Time: 8/16/21 1418	Received in Laboratory by: Adam Garner	Company: ETA	Date/Time: 8-17-21 1040

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08/31/2021

Client Sample ID: TRIP BLANK_85
Lab Sample ID: 240-154642-1
Date Collected: 08/13/21 00:00
Matrix: Water
Date Received: 08/17/21 10:40

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/19/21 18:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/19/21 18:44	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/19/21 18:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/19/21 18:44	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/19/21 18:44	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/19/21 18:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*62 - 137*		*08/19/21 18:44*	*1*
4-Bromofluorobenzene (Surr)	*114*		*56 - 136*		*08/19/21 18:44*	*1*
Toluene-d8 (Surr)	*99*		*78 - 122*		*08/19/21 18:44*	*1*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*08/19/21 18:44*	*1*

Client Sample ID: MW-142S_081321
Lab Sample ID: 240-154642-2
Date Collected: 08/13/21 12:30
Matrix: Water
Date Received: 08/17/21 10:40

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/21/21 07:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*08/21/21 07:38*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/23/21 15:30	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/23/21 15:30	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/23/21 15:30	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/23/21 15:30	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/23/21 15:30	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/23/21 15:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*62 - 137*		*08/23/21 15:30*	*1*
4-Bromofluorobenzene (Surr)	*116*		*56 - 136*		*08/23/21 15:30*	*1*
Toluene-d8 (Surr)	*102*		*78 - 122*		*08/23/21 15:30*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*08/23/21 15:30*	*1*

Client Sample ID: MW-132S_081321
Lab Sample ID: 240-154642-3
Date Collected: 08/13/21 14:30
Matrix: Water
Date Received: 08/17/21 10:40

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/21/21 08:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*08/21/21 08:03*	*1*

Client Sample ID: MW-132S_081321
Lab Sample ID: 240-154642-3
Date Collected: 08/13/21 14:30
Matrix: Water
Date Received: 08/17/21 10:40

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/23/21 15:54	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/23/21 15:54	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/23/21 15:54	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/23/21 15:54	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/23/21 15:54	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/23/21 15:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*62 - 137*		*08/23/21 15:54*	*1*
4-Bromofluorobenzene (Surr)	*118*		*56 - 136*		*08/23/21 15:54*	*1*
Toluene-d8 (Surr)	*102*		*78 - 122*		*08/23/21 15:54*	*1*
Dibromofluoromethane (Surr)	*97*		*73 - 120*		*08/23/21 15:54*	*1*

Client Sample ID: DUP-06
Lab Sample ID: 240-154642-4
Date Collected: 08/13/21 00:00
Matrix: Water
Date Received: 08/17/21 10:40

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/21/21 08:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*08/21/21 08:28*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/23/21 16:17	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/23/21 16:17	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/23/21 16:17	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/23/21 16:17	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/23/21 16:17	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/23/21 16:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*		*08/23/21 16:17*	*1*
4-Bromofluorobenzene (Surr)	*117*		*56 - 136*		*08/23/21 16:17*	*1*
Toluene-d8 (Surr)	*101*		*78 - 122*		*08/23/21 16:17*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*08/23/21 16:17*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-154930-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
9/7/2021 3:20:09 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154930-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154930-1

Job ID: 240-154930-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-154930-1

Comments
No additional comments.

Receipt
The samples were received on 8/21/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 1.1º C and 1.2º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154930-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154930-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-154930-1	TRIP BLANK_146	Water	08/19/21 00:00	08/21/21 08:00
240-154930-2	MW-135S_081921	Water	08/19/21 09:05	08/21/21 08:00
240-154930-3	MW-134S_081921	Water	08/19/21 10:50	08/21/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154930-1

Client Sample ID: TRIP BLANK_146 — Lab Sample ID: 240-154930-1

No Detections.

Client Sample ID: MW-135S_081921 — Lab Sample ID: 240-154930-2

No Detections.

Client Sample ID: MW-134S_081921 — Lab Sample ID: 240-154930-3

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154930-1

Client Sample ID: TRIP BLANK_146

Lab Sample ID: 240-154930-1

Date Collected: 08/19/21 00:00

Matrix: Water

Date Received: 08/21/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/24/21 17:36	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/24/21 17:36	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 17:36	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/24/21 17:36	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 17:36	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/24/21 17:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*08/24/21 17:36*	*1*
4-Bromofluorobenzene (Surr)	*93*		*56 - 136*		*08/24/21 17:36*	*1*
Toluene-d8 (Surr)	*93*		*78 - 122*		*08/24/21 17:36*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*08/24/21 17:36*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154930-1

Client Sample ID: MW-135S_081921
Date Collected: 08/19/21 09:05
Date Received: 08/21/21 08:00

Lab Sample ID: 240-154930-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/30/21 22:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*66 - 120*		*08/30/21 22:43*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/24/21 19:10	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/24/21 19:10	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 19:10	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/24/21 19:10	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 19:10	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/24/21 19:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*08/24/21 19:10*	*1*
4-Bromofluorobenzene (Surr)	*95*		*56 - 136*		*08/24/21 19:10*	*1*
Toluene-d8 (Surr)	*96*		*78 - 122*		*08/24/21 19:10*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*08/24/21 19:10*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154930-1

Client Sample ID: MW-134S_081921
Date Collected: 08/19/21 10:50
Date Received: 08/21/21 08:00

Lab Sample ID: 240-154930-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/30/21 23:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*		*08/30/21 23:08*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/24/21 19:34	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/24/21 19:34	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 19:34	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/24/21 19:34	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 19:34	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/24/21 19:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*08/24/21 19:34*	*1*
4-Bromofluorobenzene (Surr)	*93*		*56 - 136*		*08/24/21 19:34*	*1*
Toluene-d8 (Surr)	*94*		*78 - 122*		*08/24/21 19:34*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*08/24/21 19:34*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154930-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-154771-F-24 MS	Matrix Spike	85	92	94	86
240-154771-H-24 MSD	Matrix Spike Duplicate	87	92	95	88
240-154930-1	TRIP BLANK_146	96	93	93	95
240-154930-2	MW-135S_081921	96	95	96	95
240-154930-3	MW-134S_081921	96	93	94	95
LCS 240-500803/5	Lab Control Sample	90	97	98	91
MB 240-500803/7	Method Blank	100	97	96	97

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-154930-2	MW-135S_081921	88
240-154930-3	MW-134S_081921	87
240-155009-K-2 MS	Matrix Spike	88
240-155009-M-2 MSD	Matrix Spike Duplicate	91
LCS 240-501712/3	Lab Control Sample	84
MB 240-501712/5	Method Blank	89

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-500803/7
Matrix: Water
Analysis Batch: 500803

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/24/21 12:53	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/24/21 12:53	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 12:53	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/24/21 12:53	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 12:53	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/24/21 12:53	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*		*08/24/21 12:53*	*1*
4-Bromofluorobenzene (Surr)	*97*		*56 - 136*		*08/24/21 12:53*	*1*
Toluene-d8 (Surr)	*96*		*78 - 122*		*08/24/21 12:53*	*1*
Dibromofluoromethane (Surr)	*97*		*73 - 120*		*08/24/21 12:53*	*1*

Lab Sample ID: LCS 240-500803/5
Matrix: Water
Analysis Batch: 500803

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	24.9		ug/L		99	63 - 134
cis-1,2-Dichloroethene	25.0	24.2		ug/L		97	77 - 123
Tetrachloroethene	25.0	24.3		ug/L		97	76 - 123
trans-1,2-Dichloroethene	25.0	24.4		ug/L		97	75 - 124
Trichloroethene	25.0	24.9		ug/L		100	70 - 122
Vinyl chloride	25.0	21.3		ug/L		85	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*97*		*56 - 136*
Toluene-d8 (Surr)	*98*		*78 - 122*
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Lab Sample ID: 240-154771-F-24 MS
Matrix: Water
Analysis Batch: 500803

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	25.0	23.4		ug/L		94	56 - 135
cis-1,2-Dichloroethene	1.0	U	25.0	22.9		ug/L		92	66 - 128
Tetrachloroethene	1.0	U	25.0	21.7		ug/L		87	62 - 131
trans-1,2-Dichloroethene	1.0	U	25.0	22.8		ug/L		91	56 - 136
Trichloroethene	1.0	U	25.0	23.6		ug/L		95	61 - 124
Vinyl chloride	1.0	U	25.0	20.0		ug/L		80	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*62 - 137*
4-Bromofluorobenzene (Surr)	*92*		*56 - 136*
Toluene-d8 (Surr)	*94*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-154771-F-24 MS
Matrix: Water
Analysis Batch: 500803

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	86		73 - 120

Lab Sample ID: 240-154771-H-24 MSD
Matrix: Water
Analysis Batch: 500803

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	25.0	24.3		ug/L		97	56 - 135	4	26
cis-1,2-Dichloroethene	1.0	U	25.0	23.8		ug/L		95	66 - 128	4	14
Tetrachloroethene	1.0	U	25.0	22.3		ug/L		89	62 - 131	3	20
trans-1,2-Dichloroethene	1.0	U	25.0	23.6		ug/L		95	56 - 136	4	15
Trichloroethene	1.0	U	25.0	23.3		ug/L		93	61 - 124	1	15
Vinyl chloride	1.0	U	25.0	20.5		ug/L		82	43 - 157	2	24

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	87		62 - 137
4-Bromofluorobenzene (Surr)	92		56 - 136
Toluene-d8 (Surr)	95		78 - 122
Dibromofluoromethane (Surr)	88		73 - 120

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-501712/5
Matrix: Water
Analysis Batch: 501712

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/30/21 21:04	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	89		66 - 120		08/30/21 21:04	1

Lab Sample ID: LCS 240-501712/3
Matrix: Water
Analysis Batch: 501712

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.59		ug/L		96	80 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	84		66 - 120

Lab Sample ID: 240-155009-K-2 MS
Matrix: Water
Analysis Batch: 501712

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	9.23		ug/L		92	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*88*		*66 - 120*

Lab Sample ID: 240-155009-M-2 MSD
Matrix: Water
Analysis Batch: 501712

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.47		ug/L		95	51 - 153	3	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*91*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154930-1

GC/MS VOA

Analysis Batch: 500803

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154930-1	TRIP BLANK_146	Total/NA	Water	8260B	
240-154930-2	MW-135S_081921	Total/NA	Water	8260B	
240-154930-3	MW-134S_081921	Total/NA	Water	8260B	
MB 240-500803/7	Method Blank	Total/NA	Water	8260B	
LCS 240-500803/5	Lab Control Sample	Total/NA	Water	8260B	
240-154771-F-24 MS	Matrix Spike	Total/NA	Water	8260B	
240-154771-H-24 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 501712

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154930-2	MW-135S_081921	Total/NA	Water	8260B SIM	
240-154930-3	MW-134S_081921	Total/NA	Water	8260B SIM	
MB 240-501712/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-501712/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-155009-K-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-155009-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154930-1

Client Sample ID: TRIP BLANK_146

Lab Sample ID: 240-154930-1
Date Collected: 08/19/21 00:00
Matrix: Water
Date Received: 08/21/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	500803	08/24/21 17:36	SAM	TAL CAN

Client Sample ID: MW-135S_081921

Lab Sample ID: 240-154930-2
Date Collected: 08/19/21 09:05
Matrix: Water
Date Received: 08/21/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	500803	08/24/21 19:10	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	501712	08/30/21 22:43	CS	TAL CAN

Client Sample ID: MW-134S_081921

Lab Sample ID: 240-154930-3
Date Collected: 08/19/21 10:50
Matrix: Water
Date Received: 08/21/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	500803	08/24/21 19:34	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	501712	08/30/21 23:08	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154930-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190

TestAmerica

TestAmerica Laboratories, Inc.

Client Contact
pany Name: Arcadis
ress: 28550 Cabot Drive, Suite 500
State/Zip: Novi, MI, 48377
e: 248-994-2240
ect Name: Ford LTP Off-Site
ect Number: 30080642.402.04
30080642.402.04

Regulatory program: DW NPDES RCRA Other

Client Project Manager: Kris Hinskey
Telephone: 248-994-2240
Email: kristoffer.hinskey@arcadis.com
Sampler Name: Christian Garrido
Method of Shipment/Carrier:
Shipping/Tracking No:

Site Contact: Julia McClafferty
Telephone: 734-644-5131

Lab Contact: Mike DelMonico
Telephone: 330-497-9396

COC No:
1 of 1 COCs
For lab use only
Walk-in client
Lab sampling
Job/SDG No:

Analysis Turnaround Time
TAT if different from below
10 day
3 weeks
2 weeks
1 week
2 days
1 day

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_1410	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1345_081921	8/19/21	905		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-1345_081921	8/19/21	1050		6						6					N	G	X	X	X	X	X	X	X	1

240-154930 Chain of Custody

Page 18 of 20

Possible Hazard Identification
Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Return to Client Disposal By Lab Archive For Months

Special Instructions/QC Requirements & Comments:

mit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
el IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: Christian Garrido	Arcadis	8/19/21 1300	Received by: NOVI cold storage	Arcadis	8/19/21 1300
Relinquished by: A Hurtz	Arcadis	8/20/21 949	Received by: Amanda Battistel	ETA	8/20/21 949
Relinquished by: Amanda Battistel	ETA	8/20/21 1454	Received in Laboratory by: [illegible]	ETA	8/21/21 800

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9/7/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 154930**
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by Trent

Cooler Received on 8/21/21 Opened on 8/21/21

FedEx 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TX Foam Box Client Cooler Box Other _____

Packing material used (Bubble Wrap) Foam Plastic Bag None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt ☒ See Multiple Cooler Form

IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp _____°C Corrected Cooler Temp _____°C

IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp _____°C Corrected Cooler Temp _____°C

2 Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3 Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4 Did custody papers accompany the sample(s)?	(Yes)	No
5 Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6 Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7 Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8 Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9 For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N) and sample type of grab/comp (Y/N)?	(Y) (N)	
10 Were correct bottle(s) used for the test(s) indicated? 8.23.21	(Yes)	No
11 Sufficient quantity received to perform indicated analyses?	(Yes)	No
12 Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory		
13 Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# HC157842
14 Were VOAs on the COC?	(Yes)	No
15 Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this	Yes	(No) NA
16 Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # Covered	(Yes)	No
17 Was a LL Hg or Me Hg trip blank present? _____	Yes	(No)

Tests that are not checked for pH by Receiving

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by (me)

The TB is not logged for SIM per PM.

19 SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired

Sample(s) _____ were received in a broken container

Sample(s) _____ were received with bubble >6 mm in diameter (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory

Time preserved _____ Preservative(s) added/Lot number(s) _____

VOA Sample Preservation - Date/Time VOAs Frozen _____

WI NC-099

Login # . 154930

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form				
Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
(TA) Client Box Other	(IR-11) IR-12	1.0	1.1	(Wet Ice) Blue Ice Dry Ice Water None
(TA) Client Box Other	(IR-11) IR-12	1.1	1.2	(Wet Ice) Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice

DATA VERIFICATION REPORT

September 07, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04_W01 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 154930-1
Sample date: 2021-08-19
Report received by CADENA: 2021-09-07
Initial Data Verification completed by CADENA: 2021-09-07
Number of Samples:3
Sample Matrices: Water and trip blank
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 154930-1

		Sample Name:	TRIP BLANK_146				MW-135S_081921				MW-134S_081921			
		Lab Sample ID:	2401549301				2401549302				2401549303			
		Sample Date:	8/19/2021				8/19/2021				8/19/2021			
Analyte	Cas No.		Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC														
OSW-8260B														
1,1-Dichloroethene	75-35-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim														
1,4-Dioxane	123-91-1						ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

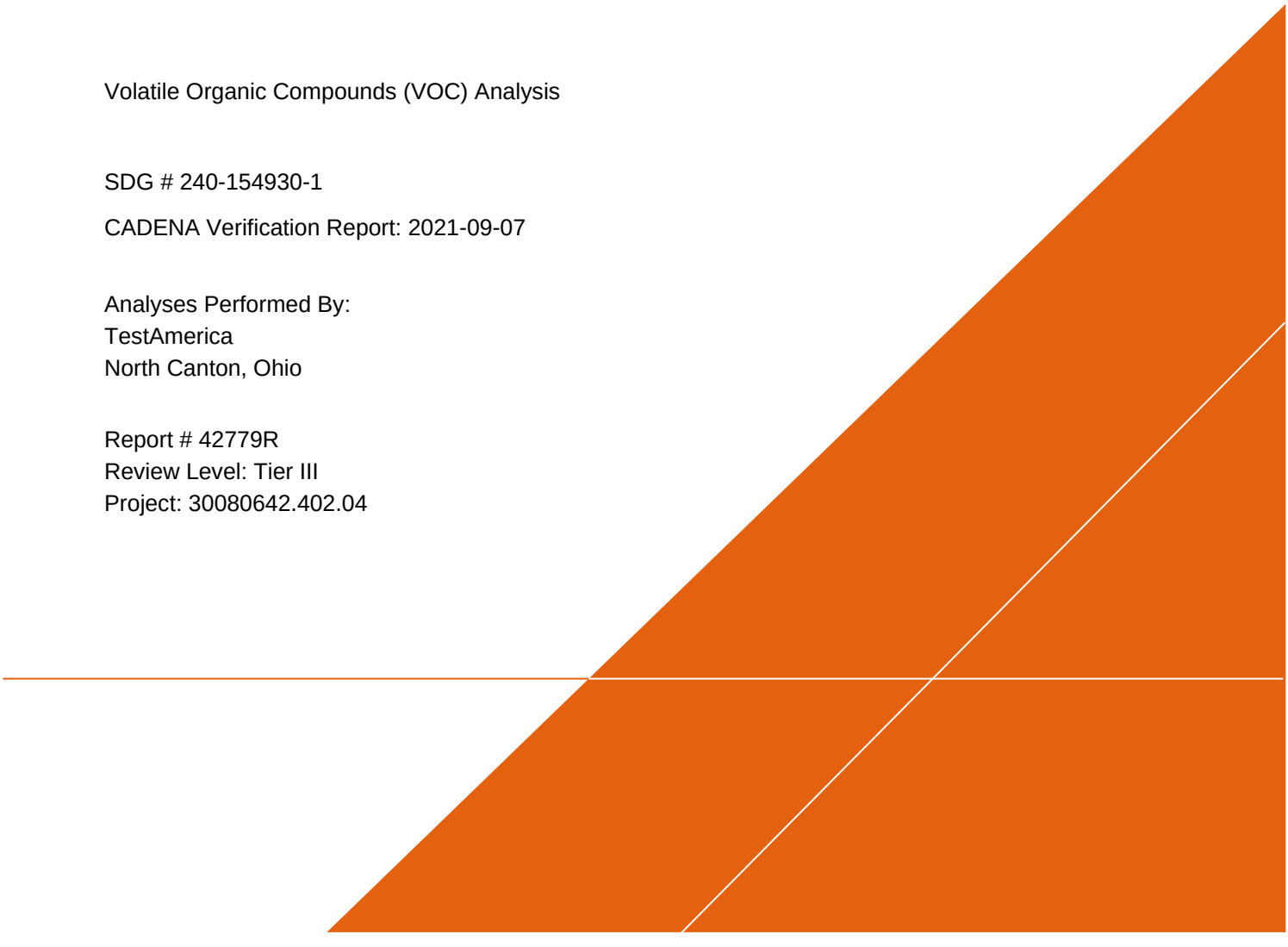
Volatile Organic Compounds (VOC) Analysis

SDG # 240-154930-1

CADENA Verification Report: 2021-09-07

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 42779R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-154930-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_146	240-154930-1	Water	08/19/21		X	
MW-135S_081921	240-154930-2	Water	08/19/21		X	X
MW-134S_081921	240-154930-3	Water	08/19/21		X	X

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

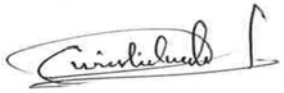
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: September 29, 2021

PEER REVIEW: Andrew Korycinski

DATE: September 29, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763 MICHIGAN ~~190~~

Regulatory program. DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact

pany Name: Arcadis

ress: 28550 Cabot Drive, Suite 500

State/Zip: Novi, MI, 48377

e: 248-994-2240

ect Name: Ford LTP Off-Site

ect Number: 30080642.402.04

30080642.402.04

Client Project Manager: Kris Hinskey

Telephone: 248-994-2240

Email: kristoffer.hinskey@arcadis.com

Sampler Name: Christian Garrido

Method of Shipment/Carrier:

Shipping/Tracking No:

Site Contact: Julia McClafferty

Telephone: 734-644-5131

Lab Contact: Mike DelMonico

Telephone: 330-497-9396

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below

10 day

3 weeks

2 weeks

1 week

2 days

1 day

Containers & Preservatives

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1 1-DCE 8260B	cis-1 2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_146	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-135S_081921	8/19/21	905		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-134S_081921	8/19/21	1050		6						6					N	G	X	X	X	X	X	X	X	

240-154930 Chain of Custody

ossible Hazard Identification

Non-Hazard Flammable kin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

Return to Client Disposal By Lab Archive For Months

cial Instructions/QC Requirements & Comments:

mit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631

el IV Reporting requested.

nquished by: Christian Garrido	Company: Arcadis	Date/Time: 8/19/21 1300	Received by: Novi cold storage	Company: Arcadis	Date/Time: 8/19/21 1300
nquished by: A Hartz	Company: Arcadis	Date/Time: 8/20/21 949	Received by: Amanda Battaglia	Company: ETA	Date/Time: 8/19/21 949
nquished by: Amanda Battaglia	Company: ETA	Date/Time: 8/20/21 1454	Received in Laboratory by: [signature]	Company: ETA	Date/Time: 8/21/21 800

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Client Sample ID: TRIP BLANK_146
Lab Sample ID: 240-154930-1
Date Collected: 08/19/21 00:00
Matrix: Water
Date Received: 08/21/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/24/21 17:36	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/24/21 17:36	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 17:36	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/24/21 17:36	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 17:36	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/24/21 17:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*08/24/21 17:36*	*1*
4-Bromofluorobenzene (Surr)	*93*		*56 - 136*		*08/24/21 17:36*	*1*
Toluene-d8 (Surr)	*93*		*78 - 122*		*08/24/21 17:36*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*08/24/21 17:36*	*1*

Client Sample ID: MW-135S_081921
Lab Sample ID: 240-154930-2
Date Collected: 08/19/21 09:05
Matrix: Water
Date Received: 08/21/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/30/21 22:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*66 - 120*		*08/30/21 22:43*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/24/21 19:10	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/24/21 19:10	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 19:10	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/24/21 19:10	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 19:10	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/24/21 19:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*08/24/21 19:10*	*1*
4-Bromofluorobenzene (Surr)	*95*		*56 - 136*		*08/24/21 19:10*	*1*
Toluene-d8 (Surr)	*96*		*78 - 122*		*08/24/21 19:10*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*08/24/21 19:10*	*1*

Client Sample ID: MW-134S_081921
Lab Sample ID: 240-154930-3
Date Collected: 08/19/21 10:50
Matrix: Water
Date Received: 08/21/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/30/21 23:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*		*08/30/21 23:08*	*1*

Client Sample ID: MW-134S_081921
Lab Sample ID: 240-154930-3

Date Collected: 08/19/21 10:50
Matrix: Water

Date Received: 08/21/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/24/21 19:34	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/24/21 19:34	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 19:34	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/24/21 19:34	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 19:34	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/24/21 19:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*08/24/21 19:34*	*1*
4-Bromofluorobenzene (Surr)	*93*		*56 - 136*		*08/24/21 19:34*	*1*
Toluene-d8 (Surr)	*94*		*78 - 122*		*08/24/21 19:34*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*08/24/21 19:34*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-154853-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
9/3/2021 9:49:00 AM

Michael DelMonico, Project Manager I
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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154853-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154853-1

Job ID: 240-154853-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-154853-1

Comments
No additional comments.

Receipt
The samples were received on 8/20/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.7º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154853-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154853-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-154853-1	TRIP BLANK_85	Water	08/18/21 00:00	08/20/21 08:00
240-154853-2	MW-136S_081821	Water	08/18/21 08:55	08/20/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154853-1

Client Sample ID: TRIP BLANK_85 — Lab Sample ID: 240-154853-1

No Detections.

Client Sample ID: MW-136S_081821 — Lab Sample ID: 240-154853-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154853-1

Client Sample ID: TRIP BLANK_85
Date Collected: 08/18/21 00:00
Date Received: 08/20/21 08:00

Lab Sample ID: 240-154853-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/24/21 19:32	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/24/21 19:32	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 19:32	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/24/21 19:32	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 19:32	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/24/21 19:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*62 - 137*		*08/24/21 19:32*	*1*
4-Bromofluorobenzene (Surr)	*115*		*56 - 136*		*08/24/21 19:32*	*1*
Toluene-d8 (Surr)	*97*		*78 - 122*		*08/24/21 19:32*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*08/24/21 19:32*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154853-1

Client Sample ID: MW-136S_081821
Date Collected: 08/18/21 08:55
Date Received: 08/20/21 08:00

Lab Sample ID: 240-154853-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/25/21 23:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*		*08/25/21 23:02*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/24/21 19:56	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/24/21 19:56	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 19:56	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/24/21 19:56	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 19:56	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/24/21 19:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*62 - 137*		*08/24/21 19:56*	*1*
4-Bromofluorobenzene (Surr)	*115*		*56 - 136*		*08/24/21 19:56*	*1*
Toluene-d8 (Surr)	*98*		*78 - 122*		*08/24/21 19:56*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*08/24/21 19:56*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154853-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-154788-E-12 MS	Matrix Spike	84	113	96	100
240-154788-F-12 MSD	Matrix Spike Duplicate	82	118	100	99
240-154853-1	TRIP BLANK_85	85	115	97	96
240-154853-2	MW-136S_081821	85	115	98	96
LCS 240-500818/4	Lab Control Sample	83	116	100	99
MB 240-500818/7	Method Blank	82	114	98	92

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-154853-2	MW-136S_081821	81
240-154936-H-3 MS	Matrix Spike	82
240-154936-N-3 MSD	Matrix Spike Duplicate	84
LCS 240-501068/3	Lab Control Sample	85
MB 240-501068/4	Method Blank	83

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-500818/7
Matrix: Water
Analysis Batch: 500818

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/24/21 15:35	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/24/21 15:35	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 15:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/24/21 15:35	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 15:35	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/24/21 15:35	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*62 - 137*		*08/24/21 15:35*	*1*
4-Bromofluorobenzene (Surr)	*114*		*56 - 136*		*08/24/21 15:35*	*1*
Toluene-d8 (Surr)	*98*		*78 - 122*		*08/24/21 15:35*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*08/24/21 15:35*	*1*

Lab Sample ID: LCS 240-500818/4
Matrix: Water
Analysis Batch: 500818

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.8		ug/L		108	63 - 134
cis-1,2-Dichloroethene	10.0	10.3		ug/L		103	77 - 123
Tetrachloroethene	10.0	9.70		ug/L		97	76 - 123
trans-1,2-Dichloroethene	10.0	10.4		ug/L		104	75 - 124
Trichloroethene	10.0	10.1		ug/L		101	70 - 122
Vinyl chloride	10.0	9.39		ug/L		94	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*62 - 137*
4-Bromofluorobenzene (Surr)	*116*		*56 - 136*
Toluene-d8 (Surr)	*100*		*78 - 122*
Dibromofluoromethane (Surr)	*99*		*73 - 120*

Lab Sample ID: 240-154788-E-12 MS
Matrix: Water
Analysis Batch: 500818

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	10.3		ug/L		103	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	10.9		ug/L		109	66 - 128
Tetrachloroethene	1.0	U	10.0	9.43		ug/L		94	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	56 - 136
Trichloroethene	1.0	U	10.0	10.2		ug/L		102	61 - 124
Vinyl chloride	1.0	U	10.0	9.55		ug/L		96	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*62 - 137*
4-Bromofluorobenzene (Surr)	*113*		*56 - 136*
Toluene-d8 (Surr)	*96*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-154788-E-12 MS
Matrix: Water
Analysis Batch: 500818

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*100*		*73 - 120*

Lab Sample ID: 240-154788-F-12 MSD
Matrix: Water
Analysis Batch: 500818

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	11.0		ug/L		110	56 - 135	6	26
cis-1,2-Dichloroethene	1.0	U	10.0	11.0		ug/L		110	66 - 128	1	14
Tetrachloroethene	1.0	U	10.0	10.1		ug/L		101	62 - 131	6	20
trans-1,2-Dichloroethene	1.0	U	10.0	10.9		ug/L		109	56 - 136	4	15
Trichloroethene	1.0	U	10.0	10.7		ug/L		107	61 - 124	5	15
Vinyl chloride	1.0	U	10.0	9.71		ug/L		97	43 - 157	2	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*62 - 137*
4-Bromofluorobenzene (Surr)	*118*		*56 - 136*
Toluene-d8 (Surr)	*100*		*78 - 122*
Dibromofluoromethane (Surr)	*99*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-501068/4
Matrix: Water
Analysis Batch: 501068

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/25/21 16:52	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*08/25/21 16:52*	*1*

Lab Sample ID: LCS 240-501068/3
Matrix: Water
Analysis Batch: 501068

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.67		ug/L		97	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

Lab Sample ID: 240-154936-H-3 MS
Matrix: Water
Analysis Batch: 501068

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	10.0		ug/L		100	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-154936-N-3 MSD
Matrix: Water
Analysis Batch: 501068

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.9		ug/L		109	51 - 153	8	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154853-1

GC/MS VOA

Analysis Batch: 500818

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154853-1	TRIP BLANK_85	Total/NA	Water	8260B	
240-154853-2	MW-136S_081821	Total/NA	Water	8260B	
MB 240-500818/7	Method Blank	Total/NA	Water	8260B	
LCS 240-500818/4	Lab Control Sample	Total/NA	Water	8260B	
240-154788-E-12 MS	Matrix Spike	Total/NA	Water	8260B	
240-154788-F-12 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 501068

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154853-2	MW-136S_081821	Total/NA	Water	8260B SIM	
MB 240-501068/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-501068/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-154936-H-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-154936-N-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154853-1

Client Sample ID: TRIP BLANK_85

Lab Sample ID: 240-154853-1

Date Collected: 08/18/21 00:00

Matrix: Water

Date Received: 08/20/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	500818	08/24/21 19:32	LRW	TAL CAN

Client Sample ID: MW-136S_081821

Lab Sample ID: 240-154853-2

Date Collected: 08/18/21 08:55

Matrix: Water

Date Received: 08/20/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	500818	08/24/21 19:56	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	501068	08/25/21 23:02	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154853-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

TestAmerica

MICHIGAN 190

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact			
pany Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
ress: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
e: 248-994-2240	Sampler Name: Christian Garrido		
ect Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
ect Number: 30080642.402.04	Shipping/Tracking No:		
30080642.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below

10 day ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day

Sample Identification	Sample Date	Sample Time	Matrix: Air	Matrix: Aqueous	Matrix: Sediment	Matrix: Solid	Matrix: Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM					Sample Specific Notes / Special Instructions:
TRIP BLANK_85	---	---		X						1					N	G	X	X	X	X	X	X	X					1 Trip Blank
MW-136S_081821	8/18/21	855		6						6					N	G	X	X	X	X	X	X	X					3 VOAs for 8260B 3 VOAs for 8260B SIM

240-154853 Chain of Custody

ossible Hazard Identification

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

cial Instructions/QC Requirements & Comments:

mit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631

el IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Christian Garrido	Arcadis	8/18/21 1300	Novi cold storage	Arcadis	8/18/21 1300
Elizabeth Spencer	Arcadis	8/19/21 937	Amanda Battenfield	ETA 8/19/21	8/18/21 937
Amanda Battenfield	ETA	8/19/21 1200	Received in Laboratory by: PH	ETA	8-20-21 0800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 154853

Client Arcadis Site Name

Cooler unpacked by: Justin H

Cooler Received on 8-20-21 Opened on 8-20-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 0.6 °C Corrected Cooler Temp. 0.7 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y)N, # of containers (Y)N, and sample type of grab/comp(Y)N)?
10. Were correct bottle(s) used for the test(s) indicated? 8/24/2021 (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# HC157842
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # Covered (Yes) No
17. Was a LL Hg or Me Hg trip blank present? ____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by: (me)

The TB is not logged for SIM per PM.

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

WI-NC-099

DATA VERIFICATION REPORT

September 03, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04_W01 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 154853-1
Sample date: 2021-08-18
Report received by CADENA: 2021-09-03
Initial Data Verification completed by CADENA: 2021-09-03
Number of Samples:2
Sample Matrices:Water and trip blank
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 154853-1

		Sample Name:	TRIP BLANK_85				MW-136S_081821			
		Lab Sample ID:	2401548531				2401548532			
		Sample Date:	8/18/2021				8/18/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

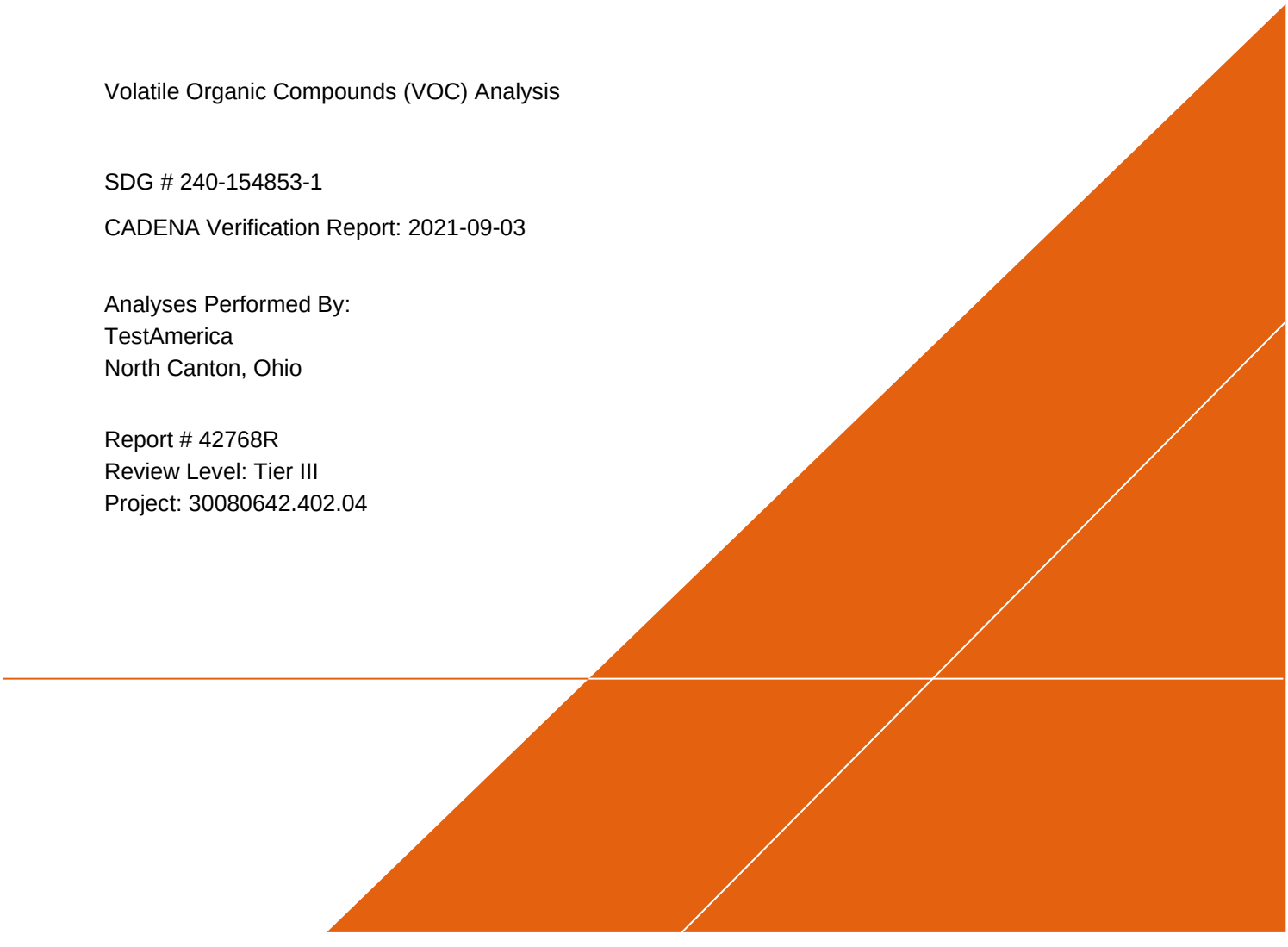
Volatile Organic Compounds (VOC) Analysis

SDG # 240-154853-1

CADENA Verification Report: 2021-09-03

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 42768R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-154853-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_85	240-154853-1	Water	08/18/21		X	
MW-136S_081821	240-154853-2	Water	08/18/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

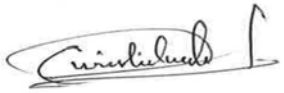
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: September 28, 2021

PEER REVIEW: Andrew Korycinski

DATE: September 28, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

MICHIGAN 190

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
pany Name: Arcadis				
ress: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
ne: 248-994-2240	Sampler Name: Christien Gamboa	TAT if different from below: 10 day; ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client
ect Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
ect Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM					Sample Specific Notes / Special Instructions:
TRIP BLANK_05	---	---		X						1					N	G	X	X	X	X	X	X	X					1 Trip Blank
MW-13S_08162021	8/18/21	855		6						6					N	G	X	X	X	X	X	X	X					3 VOAs for 8260B 3 VOAs for 8260B SIM

240-154853 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Christien Gamboa	Arcadis	8/18/21 1300	Novi cold storage	Arcadis	8/18/21 1300
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Christopher Gamboa	Arcadis	8/19/21 937	Amanda Battista	ETA 8/19/21	8/18/21 937
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
Amanda Battista	ETA	8/19/21 1200	AA	ETA	8-20-21 0800

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09/09/2021

Client Sample ID: TRIP BLANK_85
Lab Sample ID: 240-154853-1
Date Collected: 08/18/21 00:00
Matrix: Water
Date Received: 08/20/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/24/21 19:32	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/24/21 19:32	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 19:32	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/24/21 19:32	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 19:32	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/24/21 19:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*62 - 137*		*08/24/21 19:32*	*1*
4-Bromofluorobenzene (Surr)	*115*		*56 - 136*		*08/24/21 19:32*	*1*
Toluene-d8 (Surr)	*97*		*78 - 122*		*08/24/21 19:32*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*08/24/21 19:32*	*1*

Client Sample ID: MW-136S_081821
Lab Sample ID: 240-154853-2
Date Collected: 08/18/21 08:55
Matrix: Water
Date Received: 08/20/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/25/21 23:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*		*08/25/21 23:02*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/24/21 19:56	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/24/21 19:56	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 19:56	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/24/21 19:56	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/24/21 19:56	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/24/21 19:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*62 - 137*		*08/24/21 19:56*	*1*
4-Bromofluorobenzene (Surr)	*115*		*56 - 136*		*08/24/21 19:56*	*1*
Toluene-d8 (Surr)	*98*		*78 - 122*		*08/24/21 19:56*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*08/24/21 19:56*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-154765-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
8/31/2021 10:18:29 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154765-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154765-1

Job ID: 240-154765-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-154765-1

Comments
No additional comments.

Receipt
The samples were received on 8/19/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.5º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154765-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154765-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-154765-1	TRIP BLANK_108	Water	08/16/21 00:00	08/19/21 08:00
240-154765-2	MW-137S_081621	Water	08/16/21 10:51	08/19/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154765-1

Client Sample ID: TRIP BLANK_108 — Lab Sample ID: 240-154765-1

No Detections.

Client Sample ID: MW-137S_081621 — Lab Sample ID: 240-154765-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154765-1

Client Sample ID: TRIP BLANK_108
Date Collected: 08/16/21 00:00
Date Received: 08/19/21 08:00

Lab Sample ID: 240-154765-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/23/21 13:30	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/23/21 13:30	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/23/21 13:30	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/23/21 13:30	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/23/21 13:30	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/23/21 13:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*62 - 137*		*08/23/21 13:30*	*1*
4-Bromofluorobenzene (Surr)	*79*		*56 - 136*		*08/23/21 13:30*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*08/23/21 13:30*	*1*
Dibromofluoromethane (Surr)	*89*		*73 - 120*		*08/23/21 13:30*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154765-1

Client Sample ID: MW-137S_081621
Date Collected: 08/16/21 10:51
Date Received: 08/19/21 08:00

Lab Sample ID: 240-154765-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/22/21 23:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*08/22/21 23:43*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/23/21 13:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/23/21 13:52	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/23/21 13:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/23/21 13:52	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/23/21 13:52	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/23/21 13:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*120*		*62 - 137*		*08/23/21 13:52*	*1*
4-Bromofluorobenzene (Surr)	*80*		*56 - 136*		*08/23/21 13:52*	*1*
Toluene-d8 (Surr)	*97*		*78 - 122*		*08/23/21 13:52*	*1*
Dibromofluoromethane (Surr)	*90*		*73 - 120*		*08/23/21 13:52*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154765-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-154385-C-13 MS	Matrix Spike	113	89	98	90
240-154385-C-13 MSD	Matrix Spike Duplicate	115	91	100	90
240-154765-1	TRIP BLANK_108	119	79	95	89
240-154765-2	MW-137S_081621	120	80	97	90
LCS 240-500603/4	Lab Control Sample	113	98	107	95
MB 240-500603/7	Method Blank	117	84	96	89

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-154765-2	MW-137S_081621	85
240-154770-I-2 MS	Matrix Spike	81
240-154770-O-2 MSD	Matrix Spike Duplicate	82
LCS 240-500522/3	Lab Control Sample	79
MB 240-500522/4	Method Blank	80

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-500603/7
Matrix: Water
Analysis Batch: 500603

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/23/21 11:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/23/21 11:38	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/23/21 11:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/23/21 11:38	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/23/21 11:38	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/23/21 11:38	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*62 - 137*		*08/23/21 11:38*	*1*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*		*08/23/21 11:38*	*1*
Toluene-d8 (Surr)	*96*		*78 - 122*		*08/23/21 11:38*	*1*
Dibromofluoromethane (Surr)	*89*		*73 - 120*		*08/23/21 11:38*	*1*

Lab Sample ID: LCS 240-500603/4
Matrix: Water
Analysis Batch: 500603

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.48		ug/L		95	63 - 134
cis-1,2-Dichloroethene	10.0	9.77		ug/L		98	77 - 123
Tetrachloroethene	10.0	8.50		ug/L		85	76 - 123
trans-1,2-Dichloroethene	10.0	9.59		ug/L		96	75 - 124
Trichloroethene	10.0	8.94		ug/L		89	70 - 122
Vinyl chloride	10.0	9.65		ug/L		97	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*113*		*62 - 137*
4-Bromofluorobenzene (Surr)	*98*		*56 - 136*
Toluene-d8 (Surr)	*107*		*78 - 122*
Dibromofluoromethane (Surr)	*95*		*73 - 120*

Lab Sample ID: 240-154385-C-13 MS
Matrix: Water
Analysis Batch: 500603

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*113*		*62 - 137*
4-Bromofluorobenzene (Surr)	*89*		*56 - 136*
Toluene-d8 (Surr)	*98*		*78 - 122*
Dibromofluoromethane (Surr)	*90*		*73 - 120*

Lab Sample ID: 240-154385-C-13 MSD
Matrix: Water
Analysis Batch: 500603

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*115*		*62 - 137*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-154385-C-13 MSD
Matrix: Water
Analysis Batch: 500603

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	*91*		*56 - 136*
Toluene-d8 (Surr)	*100*		*78 - 122*
Dibromofluoromethane (Surr)	*90*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-500522/4
Matrix: Water
Analysis Batch: 500522

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/22/21 18:21	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*80*		*66 - 120*		*08/22/21 18:21*	*1*

Lab Sample ID: LCS 240-500522/3
Matrix: Water
Analysis Batch: 500522

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	9.61		ug/L		96	80 - 122		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*79*		*66 - 120*

Lab Sample ID: 240-154770-I-2 MS
Matrix: Water
Analysis Batch: 500522

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	10.5		ug/L		105	51 - 153		

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*

Lab Sample ID: 240-154770-O-2 MSD
Matrix: Water
Analysis Batch: 500522

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	11.5		ug/L		115	51 - 153	10	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154765-1

GC/MS VOA

Analysis Batch: 500522

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154765-2	MW-137S_081621	Total/NA	Water	8260B SIM	
MB 240-500522/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-500522/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-154770-I-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-154770-O-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 500603

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154765-1	TRIP BLANK_108	Total/NA	Water	8260B	
240-154765-2	MW-137S_081621	Total/NA	Water	8260B	
MB 240-500603/7	Method Blank	Total/NA	Water	8260B	
LCS 240-500603/4	Lab Control Sample	Total/NA	Water	8260B	
240-154385-C-13 MS	Matrix Spike	Total/NA	Water	8260B	
240-154385-C-13 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154765-1

Client Sample ID: TRIP BLANK_108

Lab Sample ID: 240-154765-1

Date Collected: 08/16/21 00:00

Matrix: Water

Date Received: 08/19/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	500603	08/23/21 13:30	LEE	TAL CAN

Client Sample ID: MW-137S_081621

Lab Sample ID: 240-154765-2

Date Collected: 08/16/21 10:51

Matrix: Water

Date Received: 08/19/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	500603	08/23/21 13:52	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	500522	08/22/21 23:43	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154765-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Gary Schafer	TAT if different from below: 3 weeks; 10 day: 2 weeks; 1 week; 2 days; 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 108	---	---		X						1							X	X	X	X	X	X	X	1 Trip Blank
MW-1375-081621	08/16/21	10:51		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-154765 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	8/16/21 1432	Noki cold storage	Arcadis	8/16/21 1432
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[illegible]	Arcadis	8/18/21 935	[illegible]	ETA	8/18/21 935
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
[illegible]	ETA	8/18/21 1147	[illegible]	TA	8-19-21 0840

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8/31/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 154765
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Brandon

Cooler Received on 8-19-21 Opened on 8-19-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # 1A Foam Box Client Cooler Box Other _____

Packing material used: ~~Bubble Wrap~~ Foam Plastic Bag None Other _____

COOLANT: ~~Wet Ice~~ Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 0.4 °C Corrected Cooler Temp. 0.5 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes) No	
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes) No NA	
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes (No)	
-Were tamper/custody seals intact and uncompromised?	(Yes) No NA	
3. Shippers' packing slip attached to the cooler(s)?	Yes (No)	
4. Did custody papers accompany the sample(s)?	(Yes) No	
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes) No	
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes) No	
7. Did all bottles arrive in good condition (Unbroken)?	(Yes) No	
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes) No	
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?	(Y) N	
10. Were correct bottle(s) used for the test(s) indicated?	(Yes) No	
11. Sufficient quantity received to perform indicated analyses?	(Yes) No	
12. Are these work share samples and all listed on the COC?	Yes (No)	
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No (NA)	pH Strip Lot# **HC157842**
14. Were VOAs on the COC?	(Yes) No	
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes (No) NA	
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____	(Yes) No	
17. Was a LL Hg or Me Hg trip blank present? _____	Yes (No)	

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page — Samples processed by: (me)

The TB is not logged for SIM per PM.

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

WI-NC-099

DATA VERIFICATION REPORT

September 01, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04_W01 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 154765-1
Sample date: 2021-08-16
Report received by CADENA: 2021-08-31
Initial Data Verification completed by CADENA: 2021-09-01
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 154765-1

		Sample Name:	TRIP BLANK_108				MW-137S_081621			
		Lab Sample ID:	2401547651				2401547652			
		Sample Date:	8/16/2021				8/16/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

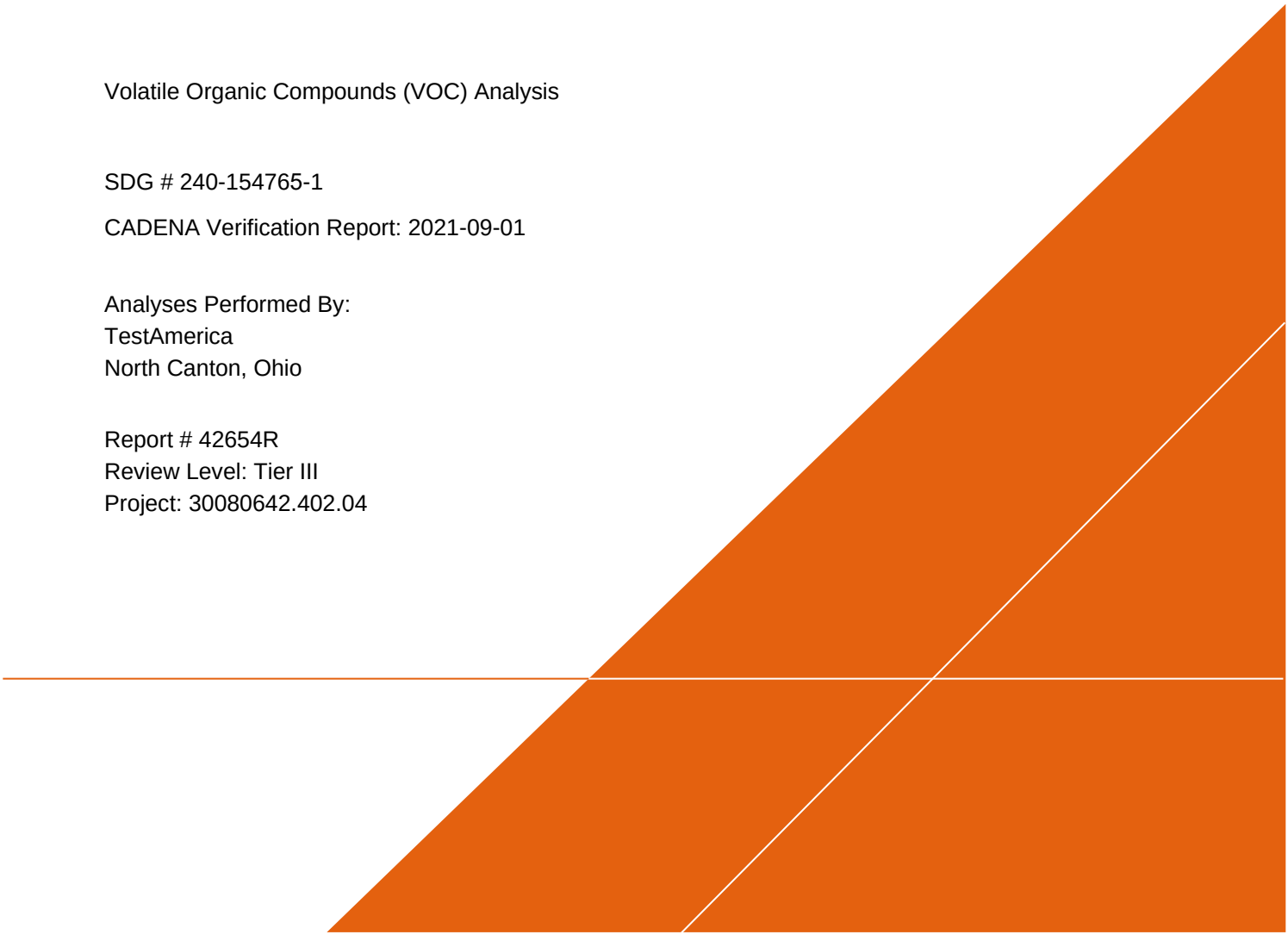
Volatile Organic Compounds (VOC) Analysis

SDG # 240-154765-1

CADENA Verification Report: 2021-09-01

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 42654R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-154764-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_108	240-154765-1	Water	08/16/21		X	
MW-137S_081621	240-154765-2	Water	08/16/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

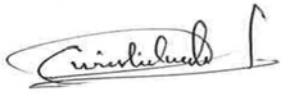
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: September 21, 2021

PEER REVIEW: Andrew Korycinski

DATE: September 21, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No: 1 of 1 COCs
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day	For lab use only
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:	10 day	Walk-in client
Project Number: 30080642.402.04	Shipping/Tracking No:		Lab sampling
PO # 30080642.402.04			Job/SDG No:

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_108	---	---		X						1							X	X	X	X	X	X	X	1 Trip Blank
MW-1375-081621	08/16/21	10:51		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-154765 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	8/16/21 1432	Nov cold storage	Arcadis	8/16/21 1432
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[illegible]	Arcadis	8/18/21 935	[illegible]	ETA	8/18/21 935
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
Amanda Butterfield	ETA	8/18/21 1147	[illegible]	TA	8-19-21 0800

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Client Sample ID: TRIP BLANK_108
Lab Sample ID: 240-154765-1
Date Collected: 08/16/21 00:00
Matrix: Water
Date Received: 08/19/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/23/21 13:30	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/23/21 13:30	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/23/21 13:30	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/23/21 13:30	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/23/21 13:30	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/23/21 13:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*62 - 137*		*08/23/21 13:30*	*1*
4-Bromofluorobenzene (Surr)	*79*		*56 - 136*		*08/23/21 13:30*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*08/23/21 13:30*	*1*
Dibromofluoromethane (Surr)	*89*		*73 - 120*		*08/23/21 13:30*	*1*

Client Sample ID: MW-137S_081621
Lab Sample ID: 240-154765-2
Date Collected: 08/16/21 10:51
Matrix: Water
Date Received: 08/19/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/22/21 23:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*08/22/21 23:43*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/23/21 13:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/23/21 13:52	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/23/21 13:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/23/21 13:52	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/23/21 13:52	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/23/21 13:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*120*		*62 - 137*		*08/23/21 13:52*	*1*
4-Bromofluorobenzene (Surr)	*80*		*56 - 136*		*08/23/21 13:52*	*1*
Toluene-d8 (Surr)	*97*		*78 - 122*		*08/23/21 13:52*	*1*
Dibromofluoromethane (Surr)	*90*		*73 - 120*		*08/23/21 13:52*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-154936-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
9/7/2021 3:23:49 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154936-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154936-1

Job ID: 240-154936-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-154936-1

Comments
No additional comments.

Receipt
The samples were received on 8/21/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 1.1º C and 1.2º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154936-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154936-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-154936-1	TRIP BLANK_75	Water	08/19/21 00:00	08/21/21 08:00
240-154936-2	MW-138S_081921	Water	08/19/21 10:06	08/21/21 08:00
240-154936-3	MW-192S_081921	Water	08/19/21 11:18	08/21/21 08:00
240-154936-4	DUP-11	Water	08/19/21 00:00	08/21/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154936-1

Client Sample ID: TRIP BLANK_75 — Lab Sample ID: 240-154936-1

No Detections.

Client Sample ID: MW-138S_081921 — Lab Sample ID: 240-154936-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	1.9		1.0	0.45	ug/L	1		8260B	Total/NA

Client Sample ID: MW-192S_081921 — Lab Sample ID: 240-154936-3

No Detections.

Client Sample ID: DUP-11 — Lab Sample ID: 240-154936-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	1.9		1.0	0.45	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154936-1

Client Sample ID: TRIP BLANK_75

Date Collected: 08/19/21 00:00
Date Received: 08/21/21 08:00

Lab Sample ID: 240-154936-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/26/21 15:43	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/26/21 15:43	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/26/21 15:43	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/26/21 15:43	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/26/21 15:43	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/26/21 15:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*62 - 137*		*08/26/21 15:43*	*1*
4-Bromofluorobenzene (Surr)	*115*		*56 - 136*		*08/26/21 15:43*	*1*
Toluene-d8 (Surr)	*99*		*78 - 122*		*08/26/21 15:43*	*1*
Dibromofluoromethane (Surr)	*97*		*73 - 120*		*08/26/21 15:43*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154936-1

Client Sample ID: MW-138S_081921
Date Collected: 08/19/21 10:06
Date Received: 08/21/21 08:00

Lab Sample ID: 240-154936-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/31/21 00:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*66 - 120*		*08/31/21 00:46*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/26/21 16:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/26/21 16:07	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/26/21 16:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/26/21 16:07	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/26/21 16:07	1
Vinyl chloride	**1.9**		1.0	0.45	ug/L			08/26/21 16:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*		*08/26/21 16:07*	*1*
4-Bromofluorobenzene (Surr)	*116*		*56 - 136*		*08/26/21 16:07*	*1*
Toluene-d8 (Surr)	*98*		*78 - 122*		*08/26/21 16:07*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*08/26/21 16:07*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154936-1

Client Sample ID: MW-192S_081921
Date Collected: 08/19/21 11:18
Date Received: 08/21/21 08:00

Lab Sample ID: 240-154936-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/25/21 23:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*08/25/21 23:52*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/26/21 16:31	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/26/21 16:31	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/26/21 16:31	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/26/21 16:31	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/26/21 16:31	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/26/21 16:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*62 - 137*		*08/26/21 16:31*	*1*
4-Bromofluorobenzene (Surr)	*110*		*56 - 136*		*08/26/21 16:31*	*1*
Toluene-d8 (Surr)	*96*		*78 - 122*		*08/26/21 16:31*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*08/26/21 16:31*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154936-1

Client Sample ID: DUP-11
Date Collected: 08/19/21 00:00
Date Received: 08/21/21 08:00

Lab Sample ID: 240-154936-4
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/31/21 01:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*66 - 120*		*08/31/21 01:11*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/26/21 17:42	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/26/21 17:42	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/26/21 17:42	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/26/21 17:42	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/26/21 17:42	1
Vinyl chloride	**1.9**		1.0	0.45	ug/L			08/26/21 17:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*62 - 137*		*08/26/21 17:42*	*1*
4-Bromofluorobenzene (Surr)	*114*		*56 - 136*		*08/26/21 17:42*	*1*
Toluene-d8 (Surr)	*98*		*78 - 122*		*08/26/21 17:42*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*08/26/21 17:42*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154936-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-154936-1	TRIP BLANK_75	85	115	99	97
240-154936-2	MW-138S_081921	86	116	98	100
240-154936-3	MW-192S_081921	83	110	96	96
240-154936-3 MS	MW-192S-MS_081921	83	116	97	100
240-154936-3 MSD	MW-192S-MSD_081921	82	118	98	99
240-154936-4	DUP-11	83	114	98	96
LCS 240-501224/4	Lab Control Sample	81	118	99	101
MB 240-501224/7	Method Blank	82	113	97	96

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-154936-2	MW-138S_081921	91
240-154936-3	MW-192S_081921	82
240-154936-3 MS	MW-192S-MS_081921	82
240-154936-3 MSD	MW-192S-MSD_081921	84
240-154936-4	DUP-11	88
240-155009-K-2 MS	Matrix Spike	88
240-155009-M-2 MSD	Matrix Spike Duplicate	91
LCS 240-501068/3	Lab Control Sample	85
LCS 240-501712/3	Lab Control Sample	84
MB 240-501068/4	Method Blank	83
MB 240-501712/5	Method Blank	89

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-501224/7
Matrix: Water
Analysis Batch: 501224

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/26/21 15:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/26/21 15:19	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/26/21 15:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/26/21 15:19	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/26/21 15:19	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/26/21 15:19	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*62 - 137*		*08/26/21 15:19*	*1*
4-Bromofluorobenzene (Surr)	*113*		*56 - 136*		*08/26/21 15:19*	*1*
Toluene-d8 (Surr)	*97*		*78 - 122*		*08/26/21 15:19*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*08/26/21 15:19*	*1*

Lab Sample ID: LCS 240-501224/4
Matrix: Water
Analysis Batch: 501224

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.6		ug/L		106	63 - 134
cis-1,2-Dichloroethene	10.0	10.6		ug/L		106	77 - 123
Tetrachloroethene	10.0	10.0		ug/L		100	76 - 123
trans-1,2-Dichloroethene	10.0	10.5		ug/L		105	75 - 124
Trichloroethene	10.0	10.3		ug/L		103	70 - 122
Vinyl chloride	10.0	9.64		ug/L		96	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*81*		*62 - 137*
4-Bromofluorobenzene (Surr)	*118*		*56 - 136*
Toluene-d8 (Surr)	*99*		*78 - 122*
Dibromofluoromethane (Surr)	*101*		*73 - 120*

Lab Sample ID: 240-154936-3 MS
Matrix: Water
Analysis Batch: 501224

Client Sample ID: MW-192S-MS_081921
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.96		ug/L		100	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	10.1		ug/L		101	66 - 128
Tetrachloroethene	1.0	U	10.0	9.12		ug/L		91	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	10.1		ug/L		101	56 - 136
Trichloroethene	1.0	U	10.0	9.61		ug/L		96	61 - 124
Vinyl chloride	1.0	U	10.0	8.44		ug/L		84	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*62 - 137*
4-Bromofluorobenzene (Surr)	*116*		*56 - 136*
Toluene-d8 (Surr)	*97*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-154936-3 MS
Matrix: Water
Analysis Batch: 501224

Client Sample ID: MW-192S-MS_081921
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*100*		*73 - 120*

Lab Sample ID: 240-154936-3 MSD
Matrix: Water
Analysis Batch: 501224

Client Sample ID: MW-192S-MSD_081921
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	10.9		ug/L		109	56 - 135	9	26
cis-1,2-Dichloroethene	1.0	U	10.0	10.7		ug/L		107	66 - 128	6	14
Tetrachloroethene	1.0	U	10.0	9.80		ug/L		98	62 - 131	7	20
trans-1,2-Dichloroethene	1.0	U	10.0	10.5		ug/L		105	56 - 136	4	15
Trichloroethene	1.0	U	10.0	9.97		ug/L		100	61 - 124	4	15
Vinyl chloride	1.0	U	10.0	9.55		ug/L		96	43 - 157	12	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*62 - 137*
4-Bromofluorobenzene (Surr)	*118*		*56 - 136*
Toluene-d8 (Surr)	*98*		*78 - 122*
Dibromofluoromethane (Surr)	*99*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-501068/4
Matrix: Water
Analysis Batch: 501068

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/25/21 16:52	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*08/25/21 16:52*	*1*

Lab Sample ID: LCS 240-501068/3
Matrix: Water
Analysis Batch: 501068

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.67		ug/L		97	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

Lab Sample ID: 240-154936-3 MS
Matrix: Water
Analysis Batch: 501068

Client Sample ID: MW-192S-MS_081921
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	10.0		ug/L		100	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-154936-3 MSD — **Client Sample ID: MW-192S-MSD_081921**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 501068

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.9		ug/L		109	51 - 153	8	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*

Lab Sample ID: MB 240-501712/5 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 501712

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/30/21 21:04	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*89*		*66 - 120*		*08/30/21 21:04*	*1*

Lab Sample ID: LCS 240-501712/3 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 501712

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	9.59		ug/L		96	80 - 122		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*

Lab Sample ID: 240-155009-K-2 MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 501712

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	9.23		ug/L		92	51 - 153		

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*88*		*66 - 120*

Lab Sample ID: 240-155009-M-2 MSD — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 501712

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.47		ug/L		95	51 - 153	3	16

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-155009-M-2 MSD
Matrix: Water
Analysis Batch: 501712

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*91*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154936-1

GC/MS VOA

Analysis Batch: 501068

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154936-3	MW-192S_081921	Total/NA	Water	8260B SIM	
MB 240-501068/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-501068/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-154936-3 MS	MW-192S-MS_081921	Total/NA	Water	8260B SIM	
240-154936-3 MSD	MW-192S-MSD_081921	Total/NA	Water	8260B SIM	

Analysis Batch: 501224

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154936-1	TRIP BLANK_75	Total/NA	Water	8260B	
240-154936-2	MW-138S_081921	Total/NA	Water	8260B	
240-154936-3	MW-192S_081921	Total/NA	Water	8260B	
240-154936-4	DUP-11	Total/NA	Water	8260B	
MB 240-501224/7	Method Blank	Total/NA	Water	8260B	
LCS 240-501224/4	Lab Control Sample	Total/NA	Water	8260B	
240-154936-3 MS	MW-192S-MS_081921	Total/NA	Water	8260B	
240-154936-3 MSD	MW-192S-MSD_081921	Total/NA	Water	8260B	

Analysis Batch: 501712

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154936-2	MW-138S_081921	Total/NA	Water	8260B SIM	
240-154936-4	DUP-11	Total/NA	Water	8260B SIM	
MB 240-501712/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-501712/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-155009-K-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-155009-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154936-1

Client Sample ID: TRIP BLANK_75

Lab Sample ID: 240-154936-1
Matrix: Water
Date Collected: 08/19/21 00:00
Date Received: 08/21/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	501224	08/26/21 15:43	LRW	TAL CAN

Client Sample ID: MW-138S_081921

Lab Sample ID: 240-154936-2
Matrix: Water
Date Collected: 08/19/21 10:06
Date Received: 08/21/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	501224	08/26/21 16:07	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	501712	08/31/21 00:46	CS	TAL CAN

Client Sample ID: MW-192S_081921

Lab Sample ID: 240-154936-3
Matrix: Water
Date Collected: 08/19/21 11:18
Date Received: 08/21/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	501224	08/26/21 16:31	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	501068	08/25/21 23:52	CS	TAL CAN

Client Sample ID: DUP-11

Lab Sample ID: 240-154936-4
Matrix: Water
Date Collected: 08/19/21 00:00
Date Received: 08/21/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	501224	08/26/21 17:42	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	501712	08/31/21 01:11	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154936-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

1/12

Chain of Custody Record

MICHIGAN 190

TestAmerica

TestAmerica Laboratory location Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone. 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Andrew Brantt		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30080642.402.04	Shipping/Tracking No:		
PO # 30080642.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT different from below

10 day ☑ 3 weeks / 2 weeks / 1 week / 2 days / 1 day

Analyses

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y/N)	Composite=C/Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes Special Instructions:
TRIP BLANK_75		--		X						1							X	X	X	X	X	X	X	1 Trip Blank
MW-1385_081921	8/19/21	1006		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-1925_081921	8/19/21	1118		X						6					N	G	X	X	X	X	X	X	X	↓
MW 1925-MS_081921	8/19/21	1118		X						6					N	G	X	X	X	X	X	X	X	Run MS/MSD
MW 1925-MSD_081921	8/19/21	1118		X						6					N	G	X	X	X	X	X	X	X	Run MS/MSD
DUP-11	8/19/21	—		X						6					N	G	X	X	X	X	X	X	X	

240-154936 Chain of Custody

Possible Hazard Identification

☑ Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee ma

Return to Client ☑ Disposal By Lab

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com, Cadena #E20363
Level V Reporting requested

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
Andrew Brantt	Arcadis	8/19/21 1600	Novi Cold Storage	Arcadis	8/19/21 1600
A Hartz	Arcadis	8/20/21 949	Andrew Brantt	ETA	8/20/21 949
Andrew Brantt	ETA	8/20/21 1454	Received in Laboratory by: [signature]	ETA	8/21/21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login #** 154936
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by Trent

Cooler Received on 8/21/21 Opened on 8/21/21

FedEx 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used (Bubble Wrap) Foam Plastic Bag None Other _____

COOLANT (Wet Ice) Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp _____ °C Corrected Cooler Temp. _____ °C

IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp _____ °C Corrected Cooler Temp _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3 Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4 Did custody papers accompany the sample(s)?	(Yes)	No
5 Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6 Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7 Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8 Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9 For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?	(Y)	(N)
10 Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11 Sufficient quantity received to perform indicated analyses? 8330/21	(Yes)	No
12 Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory		
13 Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# HC157842
14 Were VOAs on the COC?	(Yes)	No
15 Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	(No) NA
16 Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # Covered	(Yes)	No
17 Was a LL Hg or Me Hg trip blank present? _____	Yes	(No)

Tests that are not checked for pH by Receiving

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by (me)

The TB is not logged for SIM per PM

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired

Sample(s) _____ were received in a broken container

Sample(s) _____ were received with bubble >6 mm in diameter (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory

Time preserved _____ Preservative(s) added/Lot number(s) _____

VOA Sample Preservation - Date/Time VOAs Frozen _____

WI-NC-099

Login # . 154936

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form				
Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
(TA) Client Box Other	IR-11 IR-12	1.0	1.1	(Wet Ice) Blue Ice Dry Ice Water None
(TA) Client Box Other	(IR-11) IR-12	1.1	1.2	(Wet Ice) Blue Ice Dry Ice Water None
TA Client Box Other	IR-11 IR-12			Wet Ice

DATA VERIFICATION REPORT

September 07, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04_W01 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 154936-1
Sample date: 2021-08-19
Report received by CADENA: 2021-09-07
Initial Data Verification completed by CADENA: 2021-09-07
Number of Samples:4
Sample Matrices: Water and trip blank
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 154936-1

		Sample Name:	TRIP BLANK_75				MW-138S_081921				MW-192S_081921				DUP-11			
		Lab Sample ID:	2401549361				2401549362				2401549363				2401549364			
		Sample Date:	8/19/2021				8/19/2021				8/19/2021				8/19/2021			
	Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC																		
	OSW-8260B																	
	1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Vinyl chloride	75-01-4	ND	1.0	ug/l	---	1.9	1.0	ug/l	---	ND	1.0	ug/l	---	1.9	1.0	ug/l	---
	OSW-8260BBSim																	
	1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

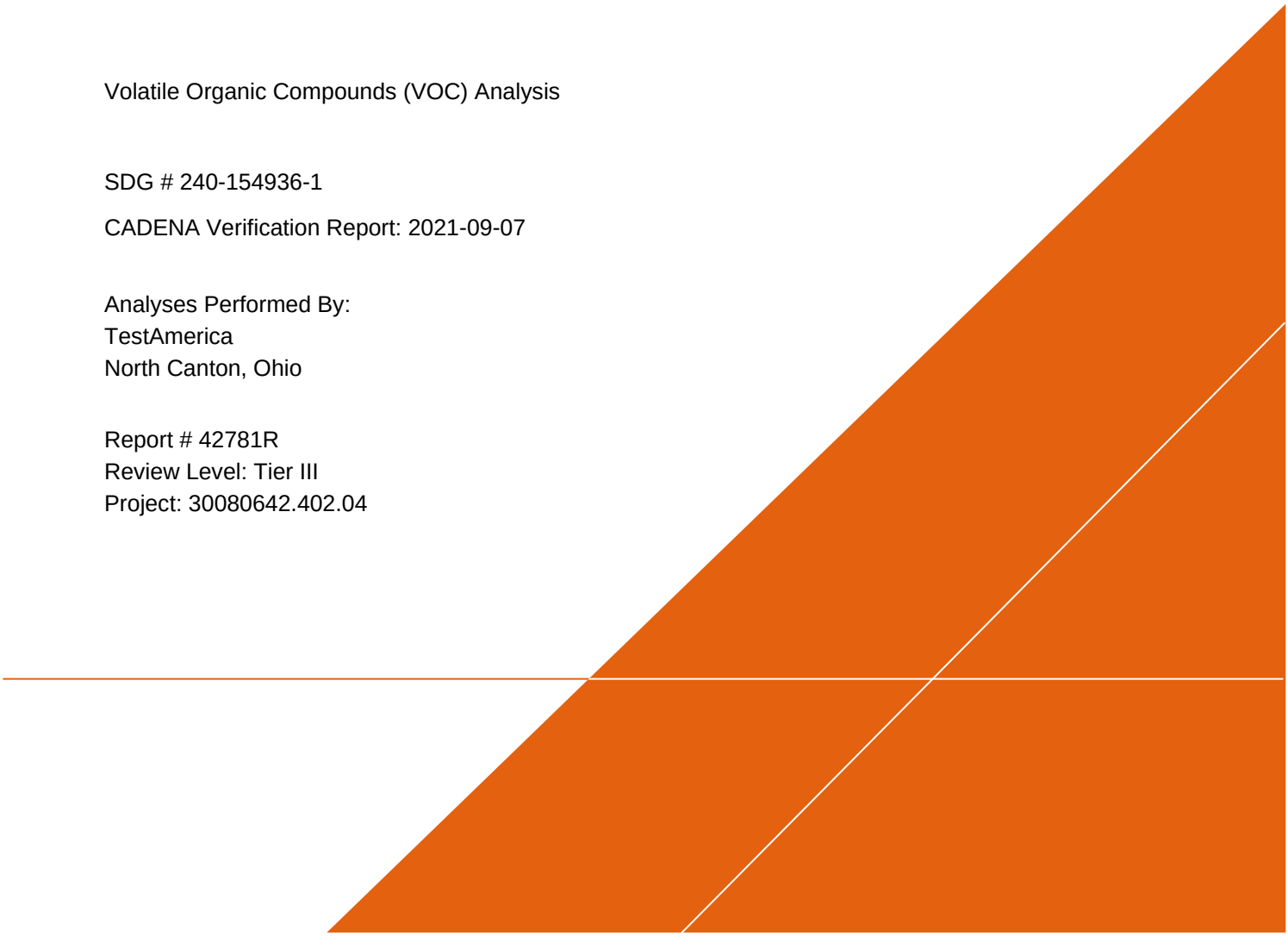
Volatile Organic Compounds (VOC) Analysis

SDG # 240-154936-1

CADENA Verification Report: 2021-09-07

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 42781R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-154936-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_75	240-154936-1	Water	08/19/21		X	
MW-138S_081921	240-154936-2	Water	08/19/21		X	X
MW-192S_081921	240-154936-3	Water	08/19/21		X	X
DUP-11	240-154936-4	Water	08/19/21	MW-138S_081921	X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result (µg/L)	Duplicate Result (µg/L)	RPD
MW-138S_081921 / DUP-11	Vinyl Chloride	1.9	1.9	AC

Notes:

AC – Acceptable

The calculated differences between the parent sample and field duplicate were acceptable.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

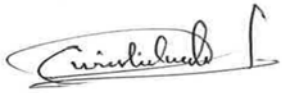
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: September 29, 2021

PEER REVIEW: Andrew Korycinski

DATE: September 29, 2021

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

1/12

Chain of Custody Record

MICHIGAN 190

TestAmerica

TestAmerica Laboratory location Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Andrew Brnitt		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30080642.402.04	Shipping/Tracking No:		
PO # 30080642.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT different from below

10 day ☑ 3 weeks 2 weeks 1 week 2 days 1 day

Analyses

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y/N)	Composite=C/Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes Special Instructions:
TRIP BLANK_75		--		X						1							X	X	X	X	X	X	X	1 Trip Blank
MW-1385_081921	8/19/21	1006		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-1925_081921	8/19/21	1118		X						6					N	G	X	X	X	X	X	X	X	↓
MW 1925-MS_081921	8/19/21	1118		X						6					N	G	X	X	X	X	X	X	X	Run MS/MSD
MW 1925-MSD_081921	8/19/21	1118		X						6					N	G	X	X	X	X	X	X	X	Run MS/MSD
DUP-11	8/19/21	—		X						6					N	G	X	X	X	X	X	X	X	

240-154936 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee ma
Return to Client ☑ Disposal By Lab

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com, Cadena #E20363
Level V Reporting requested

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
Andrew Brnitt	Arcadis	8/19/21 1600	Novi Cold Storage	Arcadis	8/19/21 1600
A Hartz	Arcadis	8/20/21 949	Andrew Brnitt	ETA	8/20/21 949
Andrew Brnitt	ETA	8/20/21 1454	Received in Laboratory by: [signature]	ETA	8/21/21 800

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09/07/2021

Client Sample ID: TRIP BLANK_75
Lab Sample ID: 240-154936-1
Date Collected: 08/19/21 00:00
Matrix: Water
Date Received: 08/21/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/26/21 15:43	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/26/21 15:43	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/26/21 15:43	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/26/21 15:43	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/26/21 15:43	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/26/21 15:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*62 - 137*		*08/26/21 15:43*	*1*
4-Bromofluorobenzene (Surr)	*115*		*56 - 136*		*08/26/21 15:43*	*1*
Toluene-d8 (Surr)	*99*		*78 - 122*		*08/26/21 15:43*	*1*
Dibromofluoromethane (Surr)	*97*		*73 - 120*		*08/26/21 15:43*	*1*

Client Sample ID: MW-138S_081921
Lab Sample ID: 240-154936-2
Date Collected: 08/19/21 10:06
Matrix: Water
Date Received: 08/21/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/31/21 00:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*66 - 120*		*08/31/21 00:46*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/26/21 16:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/26/21 16:07	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/26/21 16:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/26/21 16:07	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/26/21 16:07	1
Vinyl chloride	**1.9**		1.0	0.45	ug/L			08/26/21 16:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*		*08/26/21 16:07*	*1*
4-Bromofluorobenzene (Surr)	*116*		*56 - 136*		*08/26/21 16:07*	*1*
Toluene-d8 (Surr)	*98*		*78 - 122*		*08/26/21 16:07*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*08/26/21 16:07*	*1*

Client Sample ID: MW-192S_081921
Lab Sample ID: 240-154936-3
Date Collected: 08/19/21 11:18
Matrix: Water
Date Received: 08/21/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/25/21 23:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*08/25/21 23:52*	*1*

Client Sample ID: MW-192S_081921
Lab Sample ID: 240-154936-3
Date Collected: 08/19/21 11:18
Matrix: Water
Date Received: 08/21/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/26/21 16:31	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/26/21 16:31	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/26/21 16:31	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/26/21 16:31	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/26/21 16:31	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/26/21 16:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*62 - 137*		*08/26/21 16:31*	*1*
4-Bromofluorobenzene (Surr)	*110*		*56 - 136*		*08/26/21 16:31*	*1*
Toluene-d8 (Surr)	*96*		*78 - 122*		*08/26/21 16:31*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*08/26/21 16:31*	*1*

Client Sample ID: DUP-11
Lab Sample ID: 240-154936-4
Date Collected: 08/19/21 00:00
Matrix: Water
Date Received: 08/21/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/31/21 01:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*66 - 120*		*08/31/21 01:11*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/26/21 17:42	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/26/21 17:42	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/26/21 17:42	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/26/21 17:42	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/26/21 17:42	1
Vinyl chloride	**1.9**		1.0	0.45	ug/L			08/26/21 17:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*62 - 137*		*08/26/21 17:42*	*1*
4-Bromofluorobenzene (Surr)	*114*		*56 - 136*		*08/26/21 17:42*	*1*
Toluene-d8 (Surr)	*98*		*78 - 122*		*08/26/21 17:42*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*08/26/21 17:42*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-154375-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
8/30/2021 3:06:42 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154375-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154375-1

Job ID: 240-154375-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-154375-1

Comments
No additional comments.

Receipt
The samples were received on 8/12/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.7º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154375-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154375-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-154375-1	TRIP BLANK_58	Water	08/10/21 00:00	08/12/21 08:00
240-154375-2	MW-139S_081021	Water	08/10/21 13:30	08/12/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154375-1

Client Sample ID: TRIP BLANK_58 — Lab Sample ID: 240-154375-1

No Detections.

Client Sample ID: MW-139S_081021 — Lab Sample ID: 240-154375-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154375-1

Client Sample ID: TRIP BLANK_58
Date Collected: 08/10/21 00:00
Date Received: 08/12/21 08:00

Lab Sample ID: 240-154375-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/13/21 18:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/13/21 18:24	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/13/21 18:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/13/21 18:24	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/13/21 18:24	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/13/21 18:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*		*08/13/21 18:24*	*1*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*		*08/13/21 18:24*	*1*
Toluene-d8 (Surr)	*89*		*69 - 122*		*08/13/21 18:24*	*1*
Dibromofluoromethane (Surr)	*90*		*78 - 129*		*08/13/21 18:24*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154375-1

Client Sample ID: MW-139S_081021
Date Collected: 08/10/21 13:30
Date Received: 08/12/21 08:00

Lab Sample ID: 240-154375-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/16/21 18:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*08/16/21 18:56*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/13/21 21:18	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/13/21 21:18	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/13/21 21:18	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/13/21 21:18	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/13/21 21:18	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/13/21 21:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*		*08/13/21 21:18*	*1*
4-Bromofluorobenzene (Surr)	*90*		*47 - 134*		*08/13/21 21:18*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*08/13/21 21:18*	*1*
Dibromofluoromethane (Surr)	*90*		*78 - 129*		*08/13/21 21:18*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154375-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-154375-1	TRIP BLANK_58	93	89	89	90
240-154375-2	MW-139S_081021	93	90	90	90
LCS 240-499451/5	Lab Control Sample	88	92	90	88
MB 240-499451/7	Method Blank	88	89	89	88

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-154375-2	MW-139S_081021	82
240-154403-E-6 MS	Matrix Spike	87
240-154403-E-6 MSD	Matrix Spike Duplicate	85
LCS 240-499686/3	Lab Control Sample	79
MB 240-499686/4	Method Blank	80

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-499451/7
Matrix: Water
Analysis Batch: 499451

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/13/21 15:53	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/13/21 15:53	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/13/21 15:53	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/13/21 15:53	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/13/21 15:53	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/13/21 15:53	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 130*		*08/13/21 15:53*	*1*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*		*08/13/21 15:53*	*1*
Toluene-d8 (Surr)	*89*		*69 - 122*		*08/13/21 15:53*	*1*
Dibromofluoromethane (Surr)	*88*		*78 - 129*		*08/13/21 15:53*	*1*

Lab Sample ID: LCS 240-499451/5
Matrix: Water
Analysis Batch: 499451

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	23.6		ug/L		94	73 - 129
cis-1,2-Dichloroethene	25.0	24.8		ug/L		99	75 - 124
Tetrachloroethene	25.0	25.1		ug/L		100	70 - 125
trans-1,2-Dichloroethene	25.0	24.0		ug/L		96	74 - 130
Trichloroethene	25.0	25.7		ug/L		103	71 - 121
Vinyl chloride	25.0	23.1		ug/L		92	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 130*
4-Bromofluorobenzene (Surr)	*92*		*47 - 134*
Toluene-d8 (Surr)	*90*		*69 - 122*
Dibromofluoromethane (Surr)	*88*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-499686/4
Matrix: Water
Analysis Batch: 499686

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/16/21 16:04	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*66 - 120*		*08/16/21 16:04*	*1*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-499686/3
Matrix: Water
Analysis Batch: 499686

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	9.75		ug/L		97	80 - 122		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*66 - 120*

Lab Sample ID: 240-154403-E-6 MS
Matrix: Water
Analysis Batch: 499686

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	63		10.0	72.8	4	ug/L		98	51 - 153		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

Lab Sample ID: 240-154403-E-6 MSD
Matrix: Water
Analysis Batch: 499686

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	63		10.0	71.9	4	ug/L		90	51 - 153	1	16

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154375-1

GC/MS VOA

Analysis Batch: 499451

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154375-1	TRIP BLANK_58	Total/NA	Water	8260B	
240-154375-2	MW-139S_081021	Total/NA	Water	8260B	
MB 240-499451/7	Method Blank	Total/NA	Water	8260B	
LCS 240-499451/5	Lab Control Sample	Total/NA	Water	8260B	

Analysis Batch: 499686

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154375-2	MW-139S_081021	Total/NA	Water	8260B SIM	
MB 240-499686/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-499686/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-154403-E-6 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-154403-E-6 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Job ID: 240-154375-1
Project/Site: Ford LTP - Off Site

Client Sample ID: TRIP BLANK_58
Lab Sample ID: 240-154375-1
Date Collected: 08/10/21 00:00
Matrix: Water
Date Received: 08/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	499451	08/13/21 18:24	SAM	TAL CAN

Client Sample ID: MW-139S_081021
Lab Sample ID: 240-154375-2
Date Collected: 08/10/21 13:30
Matrix: Water
Date Received: 08/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	499451	08/13/21 21:18	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	499686	08/16/21 18:56	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154375-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

L6/17

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

MICHIGAN 190

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Emma Witherspoon		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30080642.402.04	Shipping/Tracking No:		
PO # 30080642.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below

10 day ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_58	---	---		X						1							X	X	X	X	X	X	X	1 Trip Blank
MW-1395_081021	8/10/21	1330		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-154375 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Witherspoon	Arcadis	8/10/21 1545	Novi Cold Storage	Arcadis	8/10/21 1545
Witherspoon	Arcadis	8/11/21 950	[signature]	ETA	8/11/21 950
[signature]	ETA	8/11/21 1429	Received in Laboratory by: [signature]	TA	8-12-21 0800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 154345**
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Brandon

Cooler Received on 3-12-21 Opened on 3-13-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # 1A Foam Box Client Cooler Box Other _____

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.6 °C Corrected Cooler Temp. 1.7 °C

IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?	(Y)	(Y) (Y)
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# HC157842
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	(No)

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by: (DWE)

The TB is not logged for SIM per PM.

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

WI-NC-099

DATA VERIFICATION REPORT

August 31, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04_W01 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 154375-1
Sample date: 2021-08-10
Report received by CADENA: 2021-08-30
Initial Data Verification completed by CADENA: 2021-08-31
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 154375-1

		Sample Name:	TRIP BLANK_58				MW-139S_081021			
		Lab Sample ID:	2401543751				2401543752			
		Sample Date:	8/10/2021				8/10/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

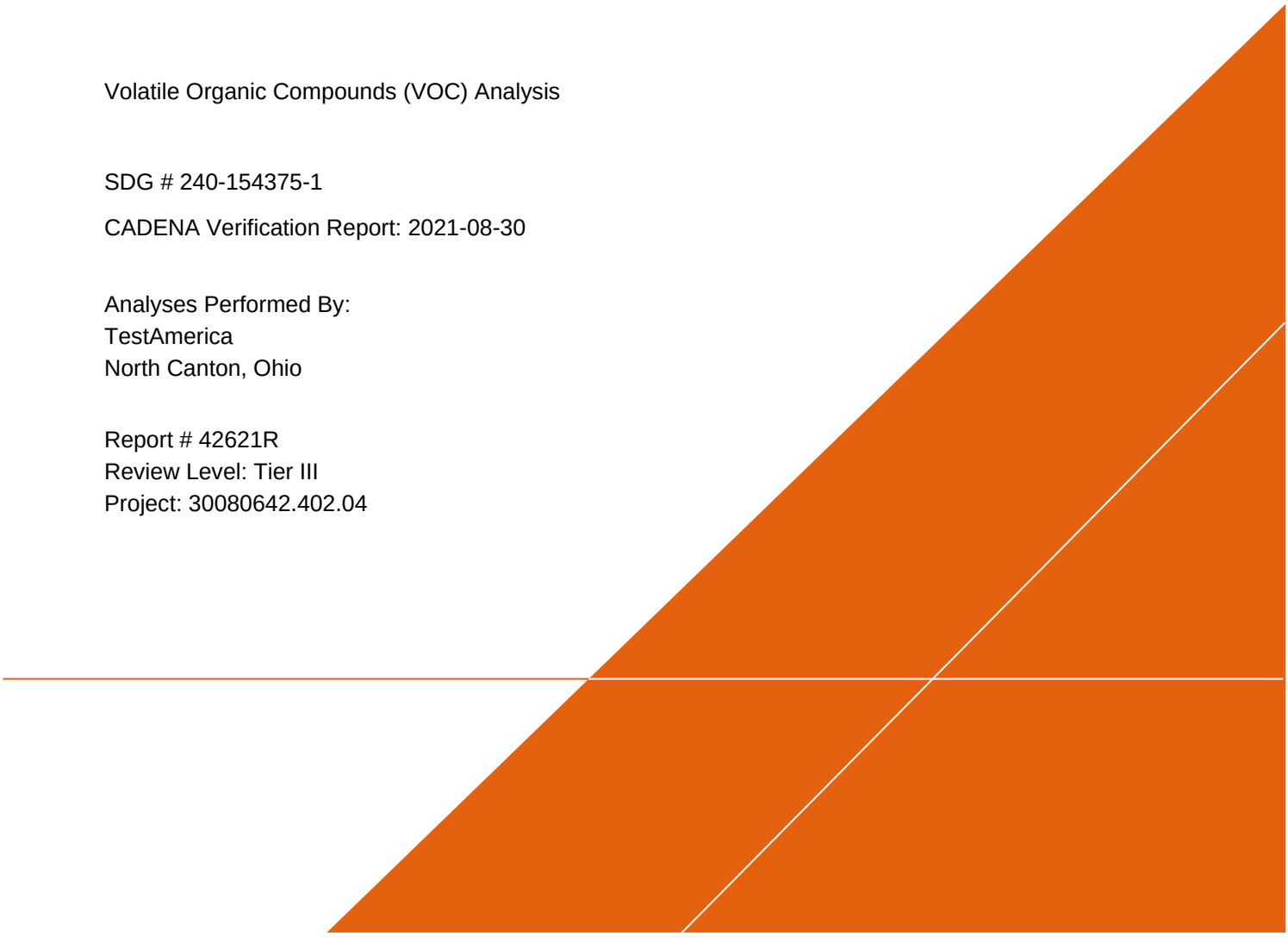
Volatile Organic Compounds (VOC) Analysis

SDG # 240-154375-1

CADENA Verification Report: 2021-08-30

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 42621R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-154375-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_58	240-154375-1	Water	08/10/21		X	
MW-139S_081021	240-154375-2	Water	08/10/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

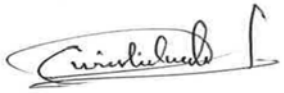
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: September 13, 2021

PEER REVIEW: Andrew Korycinski

DATE: September 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

L6/17

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

MICHIGAN 190

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Emma Witherspoon		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30080642.402.04	Shipping/Tracking No:		
PO # 30080642.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below

10 day ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day

Sample Identification	Sample Date	Sample Time	Matrix: Air	Matrix: Aqueous	Matrix: Sediment	Matrix: Solid	Matrix: Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_58	---	---		X						1							X	X	X	X	X	X	X	1 Trip Blank
MW-1395_081021	8/10/21	1330		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-154375 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Witherspoon	Arcadis	8/10/21 1545	Novi Cold Storage	Arcadis	8/10/21 1545
Witherspoon	Arcadis	8/11/21 950	[signature]	ETA	8/11/21 950
[signature]	ETA	8/11/21 1429	Received in Laboratory by: [signature]	TA	8-12-21 0800

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Client Sample ID: TRIP BLANK_58
Lab Sample ID: 240-154375-1
Date Collected: 08/10/21 00:00
Matrix: Water
Date Received: 08/12/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/13/21 18:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/13/21 18:24	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/13/21 18:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/13/21 18:24	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/13/21 18:24	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/13/21 18:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*		*08/13/21 18:24*	*1*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*		*08/13/21 18:24*	*1*
Toluene-d8 (Surr)	*89*		*69 - 122*		*08/13/21 18:24*	*1*
Dibromofluoromethane (Surr)	*90*		*78 - 129*		*08/13/21 18:24*	*1*

Client Sample ID: MW-139S_081021
Lab Sample ID: 240-154375-2
Date Collected: 08/10/21 13:30
Matrix: Water
Date Received: 08/12/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/16/21 18:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*08/16/21 18:56*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/13/21 21:18	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/13/21 21:18	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/13/21 21:18	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/13/21 21:18	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/13/21 21:18	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/13/21 21:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*		*08/13/21 21:18*	*1*
4-Bromofluorobenzene (Surr)	*90*		*47 - 134*		*08/13/21 21:18*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*08/13/21 21:18*	*1*
Dibromofluoromethane (Surr)	*90*		*78 - 129*		*08/13/21 21:18*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-154286-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
8/25/2021 9:51:11 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154286-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154286-1

Job ID: 240-154286-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-154286-1

Comments
No additional comments.

Receipt
The samples were received on 8/11/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.2º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154286-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154286-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-154286-1	TRIP BLANK_60	Water	08/09/21 00:00	08/11/21 08:00
240-154286-2	MW-140S_080921	Water	08/09/21 14:10	08/11/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154286-1

Client Sample ID: TRIP BLANK_60 — Lab Sample ID: 240-154286-1

No Detections.

Client Sample ID: MW-140S_080921 — Lab Sample ID: 240-154286-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154286-1

Client Sample ID: TRIP BLANK_60
Date Collected: 08/09/21 00:00
Date Received: 08/11/21 08:00

Lab Sample ID: 240-154286-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/13/21 17:04	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/13/21 17:04	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/13/21 17:04	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/13/21 17:04	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/13/21 17:04	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/13/21 17:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*75*		*75 - 130*		*08/13/21 17:04*	*1*
4-Bromofluorobenzene (Surr)	*109*		*47 - 134*		*08/13/21 17:04*	*1*
Toluene-d8 (Surr)	*103*		*69 - 122*		*08/13/21 17:04*	*1*
Dibromofluoromethane (Surr)	*91*		*78 - 129*		*08/13/21 17:04*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154286-1

Client Sample ID: MW-140S_080921
Date Collected: 08/09/21 14:10
Date Received: 08/11/21 08:00

Lab Sample ID: 240-154286-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/16/21 20:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*70 - 133*		*08/16/21 20:16*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/13/21 17:27	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/13/21 17:27	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/13/21 17:27	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/13/21 17:27	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/13/21 17:27	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/13/21 17:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*75 - 130*		*08/13/21 17:27*	*1*
4-Bromofluorobenzene (Surr)	*112*		*47 - 134*		*08/13/21 17:27*	*1*
Toluene-d8 (Surr)	*104*		*69 - 122*		*08/13/21 17:27*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*08/13/21 17:27*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154286-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-154286-1	TRIP BLANK_60	75	109	103	91
240-154286-2	MW-140S_080921	81	112	104	98
240-154287-E-2 MS	Matrix Spike	78	115	105	99
240-154287-F-2 MSD	Matrix Spike Duplicate	76	114	102	100
LCS 240-499418/4	Lab Control Sample	79	113	102	100
MB 240-499418/7	Method Blank	78	112	100	96

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-154286-2	MW-140S_080921	89
240-154289-F-2 MS	Matrix Spike	86
240-154289-F-2 MSD	Matrix Spike Duplicate	86
LCS 240-499687/3	Lab Control Sample	82
MB 240-499687/4	Method Blank	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-499418/7
Matrix: Water
Analysis Batch: 499418

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/13/21 14:40	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/13/21 14:40	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/13/21 14:40	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/13/21 14:40	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/13/21 14:40	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/13/21 14:40	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*78*		*75 - 130*		*08/13/21 14:40*	*1*
4-Bromofluorobenzene (Surr)	*112*		*47 - 134*		*08/13/21 14:40*	*1*
Toluene-d8 (Surr)	*100*		*69 - 122*		*08/13/21 14:40*	*1*
Dibromofluoromethane (Surr)	*96*		*78 - 129*		*08/13/21 14:40*	*1*

Lab Sample ID: LCS 240-499418/4
Matrix: Water
Analysis Batch: 499418

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.55		ug/L		96	73 - 129
cis-1,2-Dichloroethene	10.0	9.31		ug/L		93	75 - 124
Tetrachloroethene	10.0	9.73		ug/L		97	70 - 125
trans-1,2-Dichloroethene	10.0	9.37		ug/L		94	74 - 130
Trichloroethene	10.0	10.2		ug/L		102	71 - 121
Vinyl chloride	10.0	8.78		ug/L		88	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*75 - 130*
4-Bromofluorobenzene (Surr)	*113*		*47 - 134*
Toluene-d8 (Surr)	*102*		*69 - 122*
Dibromofluoromethane (Surr)	*100*		*78 - 129*

Lab Sample ID: 240-154287-E-2 MS
Matrix: Water
Analysis Batch: 499418

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.25		ug/L		92	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	9.26		ug/L		93	68 - 121
Tetrachloroethene	1.0	U	10.0	9.74		ug/L		97	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.37		ug/L		94	69 - 126
Trichloroethene	1.0	U	10.0	9.63		ug/L		96	56 - 124
Vinyl chloride	1.0	U	10.0	8.21		ug/L		82	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*78*		*75 - 130*
4-Bromofluorobenzene (Surr)	*115*		*47 - 134*
Toluene-d8 (Surr)	*105*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-154287-E-2 MS
Matrix: Water
Analysis Batch: 499418

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	99		78 - 129

Lab Sample ID: 240-154287-F-2 MSD
Matrix: Water
Analysis Batch: 499418

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.42		ug/L		94	64 - 132	2	35
cis-1,2-Dichloroethene	1.0	U	10.0	9.39		ug/L		94	68 - 121	1	35
Tetrachloroethene	1.0	U	10.0	9.68		ug/L		97	52 - 129	1	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.29		ug/L		93	69 - 126	1	35
Trichloroethene	1.0	U	10.0	9.68		ug/L		97	56 - 124	1	35
Vinyl chloride	1.0	U	10.0	8.40		ug/L		84	49 - 136	2	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	76		75 - 130
4-Bromofluorobenzene (Surr)	114		47 - 134
Toluene-d8 (Surr)	102		69 - 122
Dibromofluoromethane (Surr)	100		78 - 129

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-499687/4
Matrix: Water
Analysis Batch: 499687

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/16/21 16:09	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	81		70 - 133		08/16/21 16:09	1

Lab Sample ID: LCS 240-499687/3
Matrix: Water
Analysis Batch: 499687

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.70		ug/L		97	80 - 135

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	82		70 - 133

Lab Sample ID: 240-154289-F-2 MS
Matrix: Water
Analysis Batch: 499687

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	9.93		ug/L		99	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*

Lab Sample ID: 240-154289-F-2 MSD
Matrix: Water
Analysis Batch: 499687

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.4		ug/L		104	46 - 170	5	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154286-1

GC/MS VOA

Analysis Batch: 499418

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154286-1	TRIP BLANK_60	Total/NA	Water	8260B	
240-154286-2	MW-140S_080921	Total/NA	Water	8260B	
MB 240-499418/7	Method Blank	Total/NA	Water	8260B	
LCS 240-499418/4	Lab Control Sample	Total/NA	Water	8260B	
240-154287-E-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-154287-F-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 499687

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-154286-2	MW-140S_080921	Total/NA	Water	8260B SIM	
MB 240-499687/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-499687/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-154289-F-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-154289-F-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154286-1

Client Sample ID: TRIP BLANK_60

Lab Sample ID: 240-154286-1

Date Collected: 08/09/21 00:00

Matrix: Water

Date Received: 08/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	499418	08/13/21 17:04	LRW	TAL CAN

Client Sample ID: MW-140S_080921

Lab Sample ID: 240-154286-2

Date Collected: 08/09/21 14:10

Matrix: Water

Date Received: 08/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	499418	08/13/21 17:27	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	499687	08/16/21 20:16	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-154286-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

2.1/2.2

MICHIGAN 190

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton – 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day (10 day)		Walk-in client:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling:
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_60	---	---		X						1							X	X	X	X	X	X	X	1 Trip Blank
MW-140S_080921	8/9/21	1410		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-154286 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalla@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Emma Witherspoon	Arcadis	8/9/21 1520	NOVI cold storage	Arcadis	8/9/21 1520
Emma Witherspoon	Arcadis	8/10/21 1018	Amanda Battistini	ETA	8/10/21 1020
Amanda Battistini	ETA	8/10/21 11:13		TA	8-11-21 0800

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8/25/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 154286**
Canton Facility

Client Arcadis Site Name

Cooler unpacked by: Brandon

Cooler Received on 8-11-21 Opened on 8-11-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # 4 Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2.1 °C Corrected Cooler Temp. 2.2 °C
IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity ____	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC157842
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ____	Yes	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by: JMe

The TB is not logged for SIM, per PM.

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

WI-NC-099

DATA VERIFICATION REPORT

August 25, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04_W01 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 154286-1
Sample date: 2021-08-09
Report received by CADENA: 2021-08-25
Initial Data Verification completed by CADENA: 2021-08-25
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 154286-1

		Sample Name:	TRIP BLANK_60				MW-140S_080921			
		Lab Sample ID:	2401542861				2401542862			
		Sample Date:	8/9/2021				8/9/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

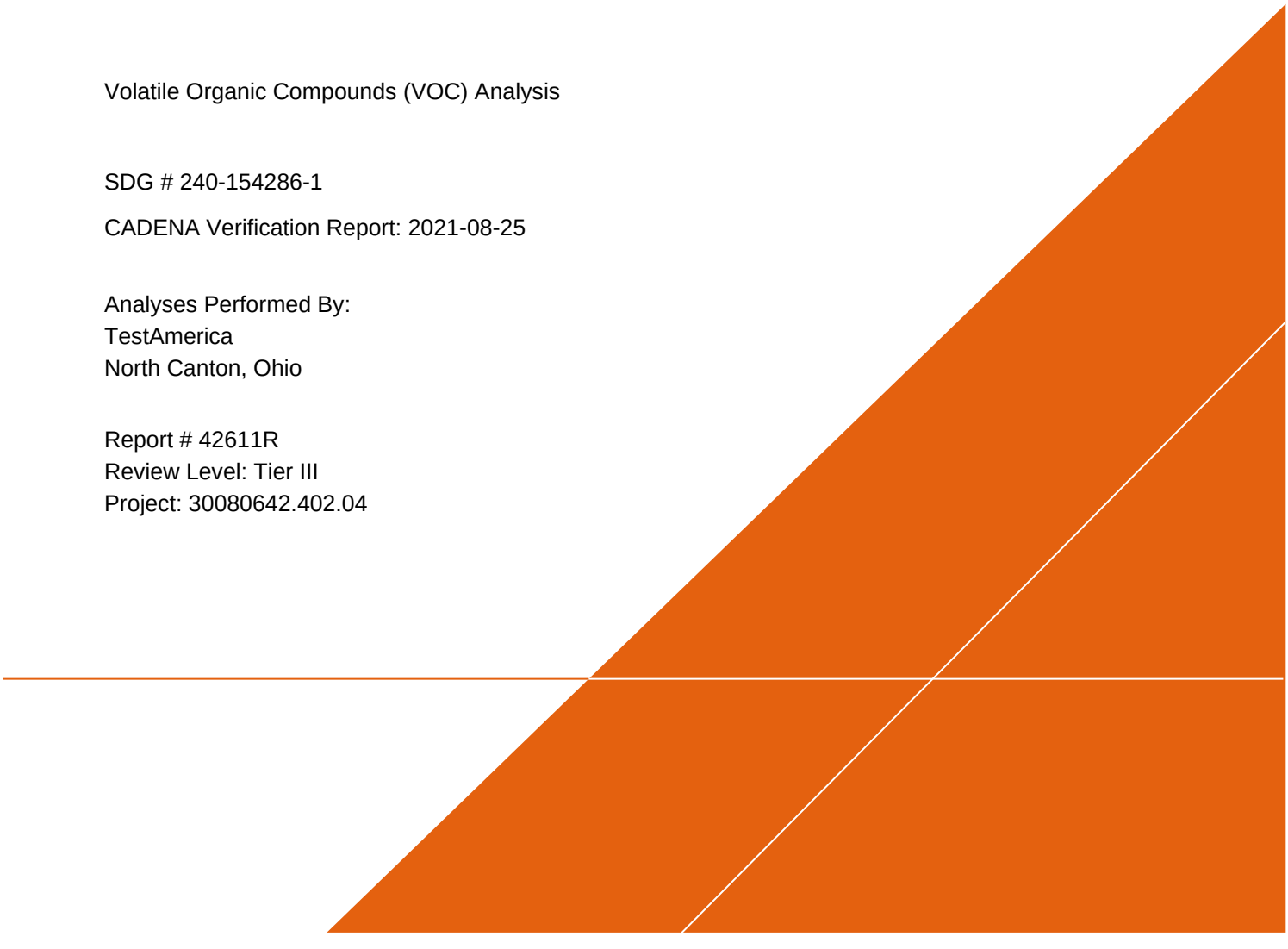
Volatile Organic Compounds (VOC) Analysis

SDG # 240-154286-1

CADENA Verification Report: 2021-08-25

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 42611R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-154286-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_60	240-154286-1	Water	08/09/21		X	
MW-140S_080921	240-154286-2	Water	08/09/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

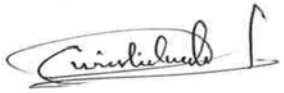
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: September 08, 2021

PEER REVIEW: Andrew Korycinski

DATE: September 08, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

2.1/2.2

MICHIGAN 190

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below 10 day ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30080642.402.04	Shipping/Tracking No:			
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM					Sample Specific Notes / Special Instructions:
TRIP BLANK_60	---	---		X						1							X	X	X	X	X	X	X					1 Trip Blank
MW-140S_080921	8/9/21	1410		X						6					N	G	X	X	X	X	X	X	X					3 VOAs for 8260B 3 VOAs for 8260B SIM

240-154286 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalla@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Emma Witherspoon	Arcadis	8/9/21 1520	NOVI Cold Storage	Arcadis	8/9/21 1520
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Emma Witherspoon	Arcadis	8/10/21 1018	[signature]	ETA	8/10/21 1020
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
[signature]	ETA	8/10/21 11:13	[signature]	TA	8-11-21 0800

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Client Sample ID: TRIP BLANK_60
Lab Sample ID: 240-154286-1
Date Collected: 08/09/21 00:00
Matrix: Water
Date Received: 08/11/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/13/21 17:04	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/13/21 17:04	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/13/21 17:04	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/13/21 17:04	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/13/21 17:04	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/13/21 17:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*75*		*75 - 130*		*08/13/21 17:04*	*1*
4-Bromofluorobenzene (Surr)	*109*		*47 - 134*		*08/13/21 17:04*	*1*
Toluene-d8 (Surr)	*103*		*69 - 122*		*08/13/21 17:04*	*1*
Dibromofluoromethane (Surr)	*91*		*78 - 129*		*08/13/21 17:04*	*1*

Client Sample ID: MW-140S_080921
Lab Sample ID: 240-154286-2
Date Collected: 08/09/21 14:10
Matrix: Water
Date Received: 08/11/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			08/16/21 20:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*70 - 133*		*08/16/21 20:16*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			08/13/21 17:27	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			08/13/21 17:27	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			08/13/21 17:27	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			08/13/21 17:27	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			08/13/21 17:27	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			08/13/21 17:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*75 - 130*		*08/13/21 17:27*	*1*
4-Bromofluorobenzene (Surr)	*112*		*47 - 134*		*08/13/21 17:27*	*1*
Toluene-d8 (Surr)	*104*		*69 - 122*		*08/13/21 17:27*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*08/13/21 17:27*	*1*

Appendix D

(Continued)

Groundwater and Soil Analytical Reports
(includes Golder Associates Historical Reports)

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159417-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/19/2021 1:48:26 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159417-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159417-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159417-1

Comments
No additional comments.

Receipt
The samples were received on 11/5/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.7° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159417-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159417-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159417-1	TRIP BLANK_32	Water	11/03/21 00:00	11/05/21 08:00
240-159417-2	MW-190S_110321	Water	11/03/21 12:41	11/05/21 08:00
240-159417-3	MW-190_110321	Water	11/03/21 13:35	11/05/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159417-1

Client Sample ID: TRIP BLANK_32 — Lab Sample ID: 240-159417-1

No Detections.

Client Sample ID: MW-190S_110321 — Lab Sample ID: 240-159417-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	0.77	J	1.0	0.46	ug/L	1		8260B	Total/NA

Client Sample ID: MW-190_110321 — Lab Sample ID: 240-159417-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	1.7		1.0	0.46	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159417-1

Client Sample ID: TRIP BLANK_32
Date Collected: 11/03/21 00:00
Date Received: 11/05/21 08:00

Lab Sample ID: 240-159417-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 18:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 18:22	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 18:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 18:22	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 18:22	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 18:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*		*11/13/21 18:22*	*1*
4-Bromofluorobenzene (Surr)	*83*		*56 - 136*		*11/13/21 18:22*	*1*
Toluene-d8 (Surr)	*110*		*78 - 122*		*11/13/21 18:22*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/13/21 18:22*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159417-1

Client Sample ID: MW-190S_110321

Lab Sample ID: 240-159417-2

Date Collected: 11/03/21 12:41

Matrix: Water

Date Received: 11/05/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/11/21 22:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*11/11/21 22:39*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 18:45	1
cis-1,2-Dichloroethene	**0.77**	**J**	1.0	0.46	ug/L			11/13/21 18:45	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 18:45	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 18:45	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 18:45	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 18:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*11/13/21 18:45*	*1*
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*11/13/21 18:45*	*1*
Toluene-d8 (Surr)	*111*		*78 - 122*		*11/13/21 18:45*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/13/21 18:45*	*1*

Client Sample ID: MW-190_110321
Date Collected: 11/03/21 13:35
Date Received: 11/05/21 08:00

Lab Sample ID: 240-159417-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 18:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*11/12/21 18:29*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 19:07	1
cis-1,2-Dichloroethene	**1.7**		1.0	0.46	ug/L			11/13/21 19:07	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 19:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 19:07	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 19:07	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 19:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*		*11/13/21 19:07*	*1*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*		*11/13/21 19:07*	*1*
Toluene-d8 (Surr)	*113*		*78 - 122*		*11/13/21 19:07*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/13/21 19:07*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159417-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159417-1	TRIP BLANK_32	100	83	110	101
240-159417-2	MW-190S_110321	96	73	111	96
240-159417-3	MW-190_110321	103	84	113	102
240-159418-E-2 MS	Matrix Spike	93	87	106	94
240-159418-L-2 MSD	Matrix Spike Duplicate	90	87	107	91
LCS 240-512817/4	Lab Control Sample	90	89	112	90
MB 240-512817/6	Method Blank	98	81	112	98

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159417-2	MW-190S_110321	82
240-159417-3	MW-190_110321	82
240-159418-H-2 MS	Matrix Spike	82
240-159418-P-2 MSD	Matrix Spike Duplicate	83
240-159543-G-3 MS	Matrix Spike	85
240-159543-O-3 MSD	Matrix Spike Duplicate	83
LCS 240-512585/4	Lab Control Sample	81
LCS 240-512758/4	Lab Control Sample	83
MB 240-512585/5	Method Blank	84
MB 240-512758/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512817/6
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 13:55	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 13:55	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:55	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 13:55	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:55	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 13:55	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*		*11/13/21 13:55*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/13/21 13:55*	*1*
Toluene-d8 (Surr)	*112*		*78 - 122*		*11/13/21 13:55*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/13/21 13:55*	*1*

Lab Sample ID: LCS 240-512817/4
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.9		ug/L		109	63 - 134
cis-1,2-Dichloroethene	10.0	10.3		ug/L		103	77 - 123
Tetrachloroethene	10.0	11.9		ug/L		119	76 - 123
trans-1,2-Dichloroethene	10.0	10.8		ug/L		108	75 - 124
Trichloroethene	10.0	9.19		ug/L		92	70 - 122
Vinyl chloride	10.0	9.48		ug/L		95	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*89*		*56 - 136*
Toluene-d8 (Surr)	*112*		*78 - 122*
Dibromofluoromethane (Surr)	*90*		*73 - 120*

Lab Sample ID: 240-159418-E-2 MS
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	10.3		ug/L		103	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.89		ug/L		99	66 - 128
Tetrachloroethene	1.0	U	10.0	9.53		ug/L		95	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.91		ug/L		99	56 - 136
Trichloroethene	1.0	U	10.0	8.16		ug/L		82	61 - 124
Vinyl chloride	1.0	U	10.0	9.96		ug/L		100	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*106*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159418-E-2 MS
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: 240-159418-L-2 MSD
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	10.0		ug/L		100	56 - 135	2	26
cis-1,2-Dichloroethene	1.0	U	10.0	10.1		ug/L		101	66 - 128	2	14
Tetrachloroethene	1.0	U	10.0	10.1		ug/L		101	62 - 131	5	20
trans-1,2-Dichloroethene	1.0	U	10.0	10.1		ug/L		101	56 - 136	2	15
Trichloroethene	1.0	U	10.0	8.61		ug/L		86	61 - 124	5	15
Vinyl chloride	1.0	U	10.0	10.2		ug/L		102	43 - 157	3	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*107*		*78 - 122*
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512585/5
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/11/21 19:04	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/11/21 19:04*	*1*

Lab Sample ID: LCS 240-512585/4
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.86		ug/L		99	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*

Lab Sample ID: 240-159418-H-2 MS
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	11.1		ug/L		111	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159418-P-2 MSD
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.2		ug/L		102	51 - 153	8	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

Lab Sample ID: MB 240-512758/5
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 16:51	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/12/21 16:51*	*1*

Lab Sample ID: LCS 240-512758/4
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.63		ug/L		96	80 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

Lab Sample ID: 240-159543-G-3 MS
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	9.98		ug/L		100	51 - 153

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

Lab Sample ID: 240-159543-O-3 MSD
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.71		ug/L		97	51 - 153	3	16

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159543-O-3 MSD
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

GC/MS VOA

Analysis Batch: 512585

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159417-2	MW-190S_110321	Total/NA	Water	8260B SIM	
MB 240-512585/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512585/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159418-H-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159418-P-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 512758

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159417-3	MW-190_110321	Total/NA	Water	8260B SIM	
MB 240-512758/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512758/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159543-G-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159543-O-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 512817

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159417-1	TRIP BLANK_32	Total/NA	Water	8260B	
240-159417-2	MW-190S_110321	Total/NA	Water	8260B	
240-159417-3	MW-190_110321	Total/NA	Water	8260B	
MB 240-512817/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512817/4	Lab Control Sample	Total/NA	Water	8260B	
240-159418-E-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159418-L-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159417-1

Client Sample ID: TRIP BLANK_32

Lab Sample ID: 240-159417-1

Date Collected: 11/03/21 00:00

Matrix: Water

Date Received: 11/05/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512817	11/13/21 18:22	LEE	TAL CAN

Client Sample ID: MW-190S_110321

Lab Sample ID: 240-159417-2

Date Collected: 11/03/21 12:41

Matrix: Water

Date Received: 11/05/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512817	11/13/21 18:45	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512585	11/11/21 22:39	CS	TAL CAN

Client Sample ID: MW-190_110321

Lab Sample ID: 240-159417-3

Date Collected: 11/03/21 13:35

Matrix: Water

Date Received: 11/05/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512817	11/13/21 19:07	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512758	11/12/21 18:29	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159417-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

0.6/0.7

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	For lab use only
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		Walk-in client
Phone: 248-994-2240	Sampler Name: Allyson Hartz	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day (10 day)		Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30080642.402.04	Shipping/Tracking No:			
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn/Ac NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_32	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-190S_110321	11/3/21	~~1337~~ 1241		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-190_110321	11/3/21	1335		X						6					N	G	X	X	X	X	X	X	X	↓

240-159417 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are ... longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Arcadis	11/3/21 1630	Novi Cold Storage	Arcadis	11/3/21 1630
Relinquished by:	ARCADIS	11/4/21 1040		ETA	11/4/21 1041
Relinquished by:	ETA	11/4/21 1049	Received in Laboratory by: M.A.	ETA	11/5/21 8:00

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11/19/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159417**
Canton Facility

Client ARCADIS Site Name _____ Cooler unpacked by: Mathew Suna

Cooler Received on 11/5/21 Opened on 11/5/21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other _____

COOLANT: ~~Wet Ice~~ Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.6 °C Corrected Cooler Temp. 0.7 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# **HC157842**
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 61042016 (Yes) No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes (No)

JMP 11-5-21

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page | Samples processed by:

TB is not logged for SIM due to insufficient volume.
JMP 11-5-21

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

November 19, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159417-1
Sample date: 2021-11-03
Report received by CADENA: 2021-11-19
Initial Data Verification completed by CADENA: 2021-11-19
Number of Samples:3
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159417-1

		Sample Name:	TRIP BLANK_32				MW-190S_110321				MW-190_110321			
		Lab Sample ID:	2401594171				2401594172				2401594173			
		Sample Date:	11/3/2021				11/3/2021				11/3/2021			
Analyte	Cas No.		Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC														
OSW-8260B														
1,1-Dichloroethene	75-35-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2		ND	1.0	ug/l	---	0.77	1.0	ug/l	J	1.7	1.0	ug/l	---
Tetrachloroethene	127-18-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim														
1,4-Dioxane	123-91-1						ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

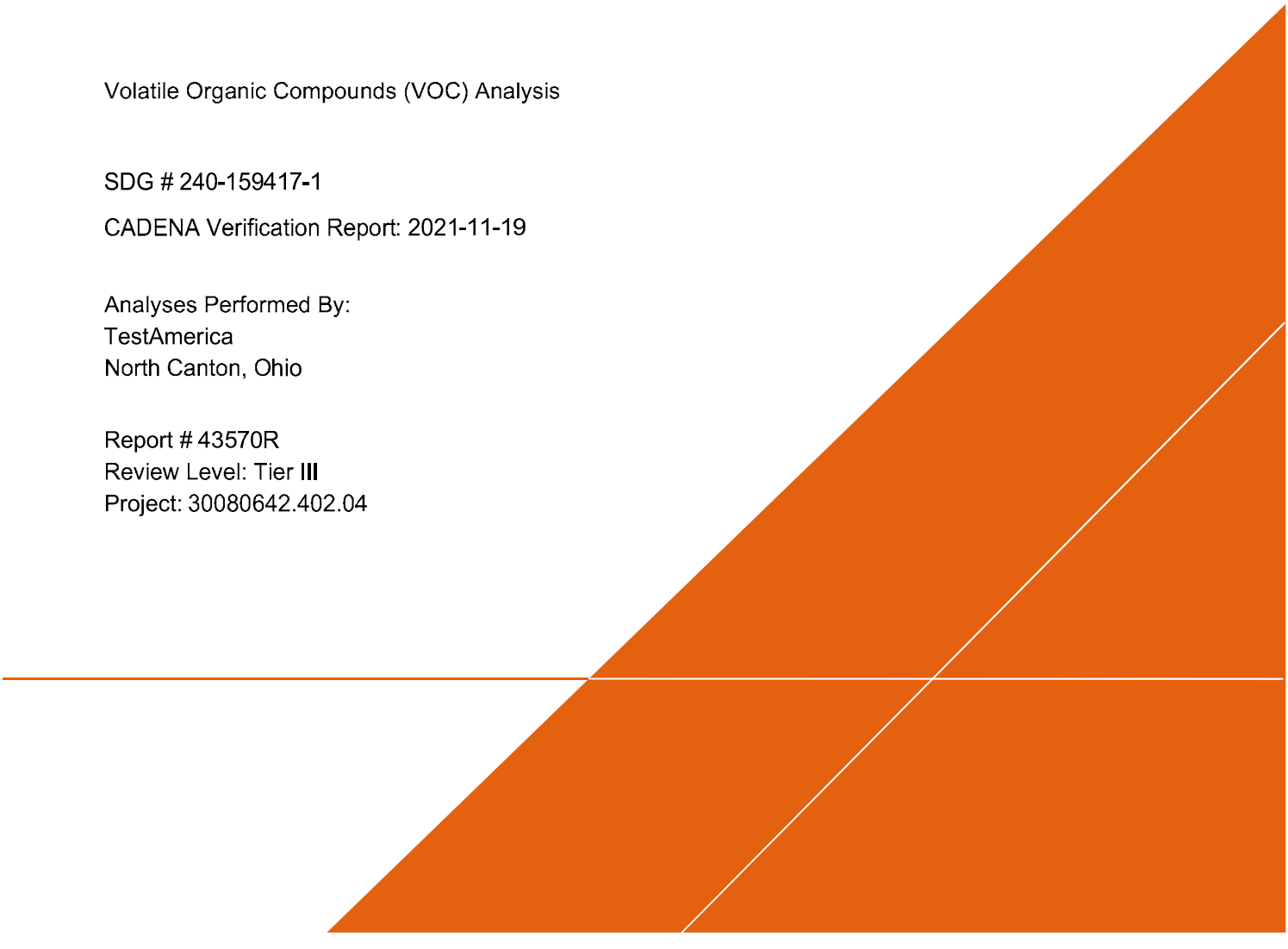
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159417-1

CADENA Verification Report: 2021-11-19

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43570R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159417-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_32	240-159417-1	Water	11/03/21		X	
MW-190S_110321	240-159417-2	Water	11/03/21		X	X
MW-190_110321	240-159417-3	Water	11/03/21		X	X

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE: 

DATE: December 07, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 8, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190

0.6/0.7

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	For lab use only
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		Walk-in client
Phone: 248-994-2240	Sampler Name: Allyson Hartz	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day (10 day)		Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30080642.402.04	Shipping/Tracking No:			
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn/Ac NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_32	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-190S_110321	11/3/21	~~1337~~ 1241		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-190_110321	11/3/21	1335		X						6					N	G	X	X	X	X	X	X	X	↓

240-159417 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are ... longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Arcadis	11/3/21 1630	Novi Cold Storage	Arcadis	11/3/21 1630
Relinquished by:	ARCADIS	11/4/21 1040		ETA	11/4/21 1041
Relinquished by:	ETA	11/4/21 1049	Received in Laboratory by: M.A.	ETA	11/5/21 8:00

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11/19/2021

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159417-1

Client Sample ID: TRIP BLANK_32
Date Collected: 11/03/21 00:00
Date Received: 11/05/21 08:00

Lab Sample ID: 240-159417-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 18:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 18:22	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 18:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 18:22	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 18:22	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 18:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*		*11/13/21 18:22*	*1*
4-Bromofluorobenzene (Surr)	*83*		*56 - 136*		*11/13/21 18:22*	*1*
Toluene-d8 (Surr)	*110*		*78 - 122*		*11/13/21 18:22*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/13/21 18:22*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159417-1

Client Sample ID: MW-190S_110321

Lab Sample ID: 240-159417-2

Date Collected: 11/03/21 12:41

Matrix: Water

Date Received: 11/05/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/11/21 22:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*11/11/21 22:39*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 18:45	1
cis-1,2-Dichloroethene	**0.77**	**J**	1.0	0.46	ug/L			11/13/21 18:45	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 18:45	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 18:45	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 18:45	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 18:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*11/13/21 18:45*	*1*
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*11/13/21 18:45*	*1*
Toluene-d8 (Surr)	*111*		*78 - 122*		*11/13/21 18:45*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/13/21 18:45*	*1*

Client Sample ID: MW-190_110321
Date Collected: 11/03/21 13:35
Date Received: 11/05/21 08:00

Lab Sample ID: 240-159417-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 18:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*11/12/21 18:29*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 19:07	1
cis-1,2-Dichloroethene	**1.7**		1.0	0.46	ug/L			11/13/21 19:07	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 19:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 19:07	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 19:07	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 19:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*		*11/13/21 19:07*	*1*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*		*11/13/21 19:07*	*1*
Toluene-d8 (Surr)	*113*		*78 - 122*		*11/13/21 19:07*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/13/21 19:07*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-160205-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
12/1/2021 1:53:06 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
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Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160205-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F2	MS/MSD RPD exceeds control limits
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160205-1

Job ID: 240-160205-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-160205-1

Comments
No additional comments.

Receipt
The samples were received on 11/17/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.3º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160205-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160205-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-160205-1	TRIP BLANK_134	Water	11/15/21 00:00	11/17/21 08:00
240-160205-2	MW-128S_111521	Water	11/15/21 11:15	11/17/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160205-1

Client Sample ID: TRIP BLANK_134 — Lab Sample ID: 240-160205-1

No Detections.

Client Sample ID: MW-128S_111521 — Lab Sample ID: 240-160205-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160205-1

Client Sample ID: TRIP BLANK_134

Date Collected: 11/15/21 00:00
Date Received: 11/17/21 08:00

Lab Sample ID: 240-160205-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/24/21 05:39	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/24/21 05:39	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/24/21 05:39	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/24/21 05:39	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/24/21 05:39	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/24/21 05:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*107*		*62 - 137*		*11/24/21 05:39*	*1*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*		*11/24/21 05:39*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/24/21 05:39*	*1*
Dibromofluoromethane (Surr)	*97*		*73 - 120*		*11/24/21 05:39*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160205-1

Client Sample ID: MW-128S_111521
Date Collected: 11/15/21 11:15
Date Received: 11/17/21 08:00

Lab Sample ID: 240-160205-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/19/21 04:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*66 - 120*		*11/19/21 04:33*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/24/21 06:01	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/24/21 06:01	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/24/21 06:01	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/24/21 06:01	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/24/21 06:01	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/24/21 06:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*62 - 137*		*11/24/21 06:01*	*1*
4-Bromofluorobenzene (Surr)	*77*		*56 - 136*		*11/24/21 06:01*	*1*
Toluene-d8 (Surr)	*114*		*78 - 122*		*11/24/21 06:01*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*11/24/21 06:01*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160205-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-160158-E-2 MSD	Matrix Spike Duplicate	100	91	96	91
240-160158-H-2 MS	Matrix Spike	102	84	112	92
240-160205-1	TRIP BLANK_134	107	78	108	97
240-160205-2	MW-128S_111521	106	77	114	95
LCS 240-514355/4	Lab Control Sample	95	80	100	88
MB 240-514355/6	Method Blank	108	79	112	97

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-160158-G-2 MS	Matrix Spike	90
240-160158-M-2 MSD	Matrix Spike Duplicate	92
240-160205-2	MW-128S_111521	91
LCS 240-513701/4	Lab Control Sample	88
MB 240-513701/5	Method Blank	85

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-514355/6
Matrix: Water
Analysis Batch: 514355

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/24/21 01:12	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/24/21 01:12	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/24/21 01:12	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/24/21 01:12	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/24/21 01:12	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/24/21 01:12	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*62 - 137*		*11/24/21 01:12*	*1*
4-Bromofluorobenzene (Surr)	*79*		*56 - 136*		*11/24/21 01:12*	*1*
Toluene-d8 (Surr)	*112*		*78 - 122*		*11/24/21 01:12*	*1*
Dibromofluoromethane (Surr)	*97*		*73 - 120*		*11/24/21 01:12*	*1*

Lab Sample ID: LCS 240-514355/4
Matrix: Water
Analysis Batch: 514355

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.60		ug/L		96	63 - 134
cis-1,2-Dichloroethene	10.0	10.0		ug/L		100	77 - 123
Tetrachloroethene	10.0	9.21		ug/L		92	76 - 123
trans-1,2-Dichloroethene	10.0	9.45		ug/L		95	75 - 124
Trichloroethene	10.0	8.64		ug/L		86	70 - 122
Vinyl chloride	10.0	10.0		ug/L		100	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*95*		*62 - 137*
4-Bromofluorobenzene (Surr)	*80*		*56 - 136*
Toluene-d8 (Surr)	*100*		*78 - 122*
Dibromofluoromethane (Surr)	*88*		*73 - 120*

Lab Sample ID: 240-160158-E-2 MSD
Matrix: Water
Analysis Batch: 514355

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.59		ug/L		96	56 - 135	14	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.56		ug/L		96	66 - 128	9	14
Tetrachloroethene	1.0	U	10.0	8.55		ug/L		86	62 - 131	14	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.09		ug/L		91	56 - 136	5	15
Trichloroethene	1.0	U F2	10.0	8.30	F2	ug/L		83	61 - 124	17	15
Vinyl chloride	1.0	U F2	10.0	12.1	F2	ug/L		121	43 - 157	25	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*91*		*56 - 136*
Toluene-d8 (Surr)	*96*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-160158-E-2 MSD
Matrix: Water
Analysis Batch: 514355

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Lab Sample ID: 240-160158-H-2 MS
Matrix: Water
Analysis Batch: 514355

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	8.36		ug/L		84	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	8.77		ug/L		88	66 - 128
Tetrachloroethene	1.0	U	10.0	7.41		ug/L		74	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	8.61		ug/L		86	56 - 136
Trichloroethene	1.0	U F2	10.0	6.97		ug/L		70	61 - 124
Vinyl chloride	1.0	U F2	10.0	9.41		ug/L		94	43 - 157

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*
Toluene-d8 (Surr)	*112*		*78 - 122*
Dibromofluoromethane (Surr)	*92*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513701/5
Matrix: Water
Analysis Batch: 513701

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 19:39	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/18/21 19:39*	*1*

Lab Sample ID: LCS 240-513701/4
Matrix: Water
Analysis Batch: 513701

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.2		ug/L		102	80 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*88*		*66 - 120*

Lab Sample ID: 240-160158-G-2 MS
Matrix: Water
Analysis Batch: 513701

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*90*		*66 - 120*

Lab Sample ID: 240-160158-M-2 MSD
Matrix: Water
Analysis Batch: 513701

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.5		ug/L		105	51 - 153	1	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*92*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160205-1

GC/MS VOA

Analysis Batch: 513701

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-160205-2	MW-128S_111521	Total/NA	Water	8260B SIM	
MB 240-513701/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513701/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-160158-G-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-160158-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 514355

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-160205-1	TRIP BLANK_134	Total/NA	Water	8260B	
240-160205-2	MW-128S_111521	Total/NA	Water	8260B	
MB 240-514355/6	Method Blank	Total/NA	Water	8260B	
LCS 240-514355/4	Lab Control Sample	Total/NA	Water	8260B	
240-160158-E-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	
240-160158-H-2 MS	Matrix Spike	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160205-1

Client Sample ID: TRIP BLANK_134

Lab Sample ID: 240-160205-1

Date Collected: 11/15/21 00:00

Matrix: Water

Date Received: 11/17/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	514355	11/24/21 05:39	LEE	TAL CAN

Client Sample ID: MW-128S_111521

Lab Sample ID: 240-160205-2

Date Collected: 11/15/21 11:15

Matrix: Water

Date Received: 11/17/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	514355	11/24/21 06:01	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513701	11/19/21 04:33	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160205-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

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Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Sam Hindale / COURIER CHRISTINA WEAVER	TAT if different from below: 10 day ✓ 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_134	—	—		X						1					N	C	X	X	X	X	X	X	X	1 Trip Blank
MW-128S-111521	11/15/21	11 15		6						6					N	C	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-160205 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard — Flammable — Skin Irritant — Poison B — Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client — ✓ Disposal By Lab — Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco com. Cadena #E203631
Level IV Reporting requested.

Relinquished by: SH	Company: Arcadis	Date/Time: 11/15/21 16.45	Received by: Non cold storage	Company: Arcadis	Date/Time: 11/15/21 16.45
Relinquished by:	Company: ARCADIS	Date/Time: 11/16/21 / 1043	Received by:	Company: ETA	Date/Time: 11/16/21 1043
Relinquished by:	Company: ETA	Date/Time: 11/16/21	Received in Laboratory by:	Company: ETA	Date/Time: 11/17/21 800

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12/1/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 160205**
Canton Facility

Client Arcadis Site Name

Cooler Received on 11/17/21 Opened on 11/17/21

Cooler unpacked by: Trent

FedEx 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # 784 Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT. (Wet Ice) Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp 0.2 °C Corrected Cooler Temp. 0.3 °C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp ____ °C Corrected Cooler Temp. ____ °C

2 Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3 Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4 Did custody papers accompany the sample(s)?	(Yes)	No
5 Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7 Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9 For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10 Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# HC157842
14. Were VOAs on the COC?	(Yes)	No
15 Were air bubbles >6 mm in any VOA vials? ● ← Larger than this	Yes	(No) NA
16 Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #0104201G	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

no SIM on TB per corrected COC. (me) 11/17/21

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.

Sample(s) ____ were received in a broken container

Sample(s) ____ were received with bubble >6 mm in diameter (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory

Time preserved ____ Preservative(s) added/Lot number(s). ____

VOA Sample Preservation - Date/Time VOAs Frozen ____

WI-NC-099

DATA VERIFICATION REPORT

December 01, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 160205-1
Sample date: 2021-11-15
Report received by CADENA: 2021-12-01
Initial Data Verification completed by CADENA: 2021-12-01
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch MS/MSD recovery outliers were not determined using a client sample so qualification was not required based on these sample-specific QC outliers.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 160205-1

		Sample Name:	TRIP BLANK_134				MW-128S_111521			
		Lab Sample ID:	2401602051				2401602052			
		Sample Date:	11/15/2021				11/15/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

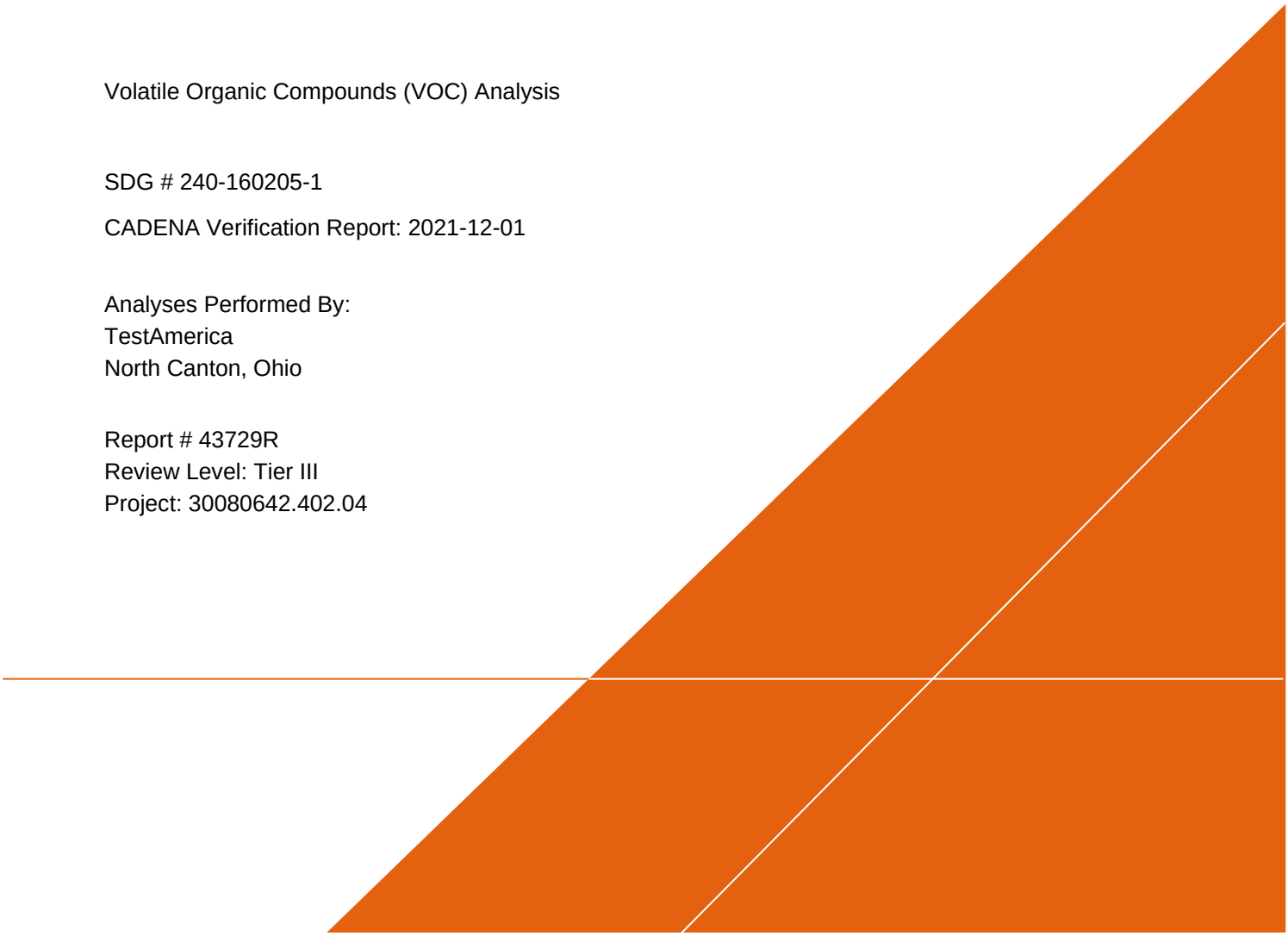
Volatile Organic Compounds (VOC) Analysis

SDG # 240-160205-1

CADENA Verification Report: 2021-12-01

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43729R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-160205-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_134	240-160205-1	Water	11/15/21		X	
MW-128S_111521	240-160205-2	Water	11/15/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

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Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No: 1 of 1 COCs
Phone: 248-994-2240	Sampler Name: Sam Trinale / COURIER CHRISTINA WERNER	TAT if different from below: 10 day (•) 2 weeks; 3 weeks; 1 week; 2 days; 1 day	For lab use only: Walk-in client; Lab sampling; Job/SDG No:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30080642.402.04	Shipping/Tracking No:		
PO # 30080642.402.04			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_134	—	—		X						1					N	C	X	X	X	X	X	X	X	1 Trip Blank
MW-128S-111521	11/15/21	11 15		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-160205 Chain of Custody

Possible Hazard Identification: (•) Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; (•) Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: SM	Arcadis	11/15/21 16.45	Received by: Non cold storage	Arcadis	11/15/21 16.45
Relinquished by:	ARCADIS	11/16/21 / 1043	Received by:	ETA	11/16/21 1043
Relinquished by:	ETA	11/16/21	Received in Laboratory by:	ETA	11/17/21 800

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12/01/2021

Client Sample ID: TRIP BLANK_134
Lab Sample ID: 240-160205-1
Date Collected: 11/15/21 00:00
Matrix: Water
Date Received: 11/17/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/24/21 05:39	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/24/21 05:39	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/24/21 05:39	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/24/21 05:39	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/24/21 05:39	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/24/21 05:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*107*		*62 - 137*		*11/24/21 05:39*	*1*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*		*11/24/21 05:39*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/24/21 05:39*	*1*
Dibromofluoromethane (Surr)	*97*		*73 - 120*		*11/24/21 05:39*	*1*

Client Sample ID: MW-128S_111521
Lab Sample ID: 240-160205-2
Date Collected: 11/15/21 11:15
Matrix: Water
Date Received: 11/17/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/19/21 04:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*66 - 120*		*11/19/21 04:33*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/24/21 06:01	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/24/21 06:01	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/24/21 06:01	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/24/21 06:01	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/24/21 06:01	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/24/21 06:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*62 - 137*		*11/24/21 06:01*	*1*
4-Bromofluorobenzene (Surr)	*77*		*56 - 136*		*11/24/21 06:01*	*1*
Toluene-d8 (Surr)	*114*		*78 - 122*		*11/24/21 06:01*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*11/24/21 06:01*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-160150-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
12/3/2021 3:44:16 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
Review your project results through TotalAccess
Have a Question? Ask The Expert
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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160150-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F2	MS/MSD RPD exceeds control limits
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160150-1

Job ID: 240-160150-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-160150-1

Comments
No additional comments.

Receipt
The samples were received on 11/16/2021 10:15 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.9º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160150-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160150-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-160150-1	TRIP BLANK_127	Water	11/12/21 00:00	11/16/21 10:15
240-160150-2	MW-146S_111221	Water	11/12/21 13:50	11/16/21 10:15

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160150-1

Client Sample ID: TRIP BLANK_127 — Lab Sample ID: 240-160150-1

No Detections.

Client Sample ID: MW-146S_111221 — Lab Sample ID: 240-160150-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160150-1

Client Sample ID: TRIP BLANK_127
Date Collected: 11/12/21 00:00
Date Received: 11/16/21 10:15

Lab Sample ID: 240-160150-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 04:43	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 04:43	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 04:43	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 04:43	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 04:43	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 04:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*		*11/20/21 04:43*	*1*
4-Bromofluorobenzene (Surr)	*76*		*56 - 136*		*11/20/21 04:43*	*1*
Toluene-d8 (Surr)	*107*		*78 - 122*		*11/20/21 04:43*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*11/20/21 04:43*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160150-1

Client Sample ID: MW-146S_111221
Date Collected: 11/12/21 13:50
Date Received: 11/16/21 10:15

Lab Sample ID: 240-160150-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/19/21 02:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*		*11/19/21 02:19*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 05:05	1
cis-1,2-Dichloroethene	1.0	U F2	1.0	0.46	ug/L			11/20/21 05:05	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 05:05	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 05:05	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 05:05	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 05:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*62 - 137*		*11/20/21 05:05*	*1*
4-Bromofluorobenzene (Surr)	*74*		*56 - 136*		*11/20/21 05:05*	*1*
Toluene-d8 (Surr)	*113*		*78 - 122*		*11/20/21 05:05*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/20/21 05:05*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160150-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-160150-1	TRIP BLANK_127	102	76	107	95
240-160150-2	MW-146S_111221	108	74	113	101
240-160150-2 MS	MW-146S_111221	99	85	110	90
240-160150-2 MSD	MW-146S_111221	104	88	122	96
LCS 240-513905/4	Lab Control Sample	104	89	118	97
MB 240-513905/6	Method Blank	99	73	109	92

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159739-G-3 MS	Matrix Spike	74
240-159739-M-3 MSD	Matrix Spike Duplicate	75
240-160150-2	MW-146S_111221	78
LCS 240-513700/4	Lab Control Sample	75
MB 240-513700/5	Method Blank	77

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513905/6
Matrix: Water
Analysis Batch: 513905

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 03:58	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 03:58	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 03:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 03:58	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 03:58	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 03:58	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/20/21 03:58*	*1*
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*11/20/21 03:58*	*1*
Toluene-d8 (Surr)	*109*		*78 - 122*		*11/20/21 03:58*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*11/20/21 03:58*	*1*

Lab Sample ID: LCS 240-513905/4
Matrix: Water
Analysis Batch: 513905

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.9		ug/L		109	63 - 134
cis-1,2-Dichloroethene	10.0	10.4		ug/L		104	77 - 123
Tetrachloroethene	10.0	10.3		ug/L		103	76 - 123
trans-1,2-Dichloroethene	10.0	10.6		ug/L		106	75 - 124
Trichloroethene	10.0	8.96		ug/L		90	70 - 122
Vinyl chloride	10.0	11.0		ug/L		110	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*104*		*62 - 137*
4-Bromofluorobenzene (Surr)	*89*		*56 - 136*
Toluene-d8 (Surr)	*118*		*78 - 122*
Dibromofluoromethane (Surr)	*97*		*73 - 120*

Lab Sample ID: 240-160150-2 MS
Matrix: Water
Analysis Batch: 513905

Client Sample ID: MW-146S_111221
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	7.96		ug/L		80	56 - 135
cis-1,2-Dichloroethene	1.0	U F2	10.0	8.59		ug/L		86	66 - 128
Tetrachloroethene	1.0	U	10.0	7.18		ug/L		72	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	8.27		ug/L		83	56 - 136
Trichloroethene	1.0	U	10.0	6.70		ug/L		67	61 - 124
Vinyl chloride	1.0	U	10.0	8.91		ug/L		89	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*
Toluene-d8 (Surr)	*110*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-160150-2 MS
Matrix: Water
Analysis Batch: 513905

Client Sample ID: MW-146S_111221
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*90*		*73 - 120*

Lab Sample ID: 240-160150-2 MSD
Matrix: Water
Analysis Batch: 513905

Client Sample ID: MW-146S_111221
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.12		ug/L		91	56 - 135	14	26
cis-1,2-Dichloroethene	1.0	U F2	10.0	10.1	F2	ug/L		101	66 - 128	16	14
Tetrachloroethene	1.0	U	10.0	8.59		ug/L		86	62 - 131	18	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.32		ug/L		93	56 - 136	12	15
Trichloroethene	1.0	U	10.0	7.73		ug/L		77	61 - 124	14	15
Vinyl chloride	1.0	U	10.0	9.29		ug/L		93	43 - 157	4	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*104*		*62 - 137*
4-Bromofluorobenzene (Surr)	*88*		*56 - 136*
Toluene-d8 (Surr)	*122*		*78 - 122*
Dibromofluoromethane (Surr)	*96*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513700/5
Matrix: Water
Analysis Batch: 513700

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 19:41	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*		*11/18/21 19:41*	*1*

Lab Sample ID: LCS 240-513700/4
Matrix: Water
Analysis Batch: 513700

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.4		ug/L		104	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*

Lab Sample ID: 240-159739-G-3 MS
Matrix: Water
Analysis Batch: 513700

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.4		ug/L		104	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*74*		*66 - 120*

Lab Sample ID: 240-159739-M-3 MSD
Matrix: Water
Analysis Batch: 513700

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153	2	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160150-1

GC/MS VOA

Analysis Batch: 513700

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-160150-2	MW-146S_111221	Total/NA	Water	8260B SIM	
MB 240-513700/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513700/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159739-G-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159739-M-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513905

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-160150-1	TRIP BLANK_127	Total/NA	Water	8260B	
240-160150-2	MW-146S_111221	Total/NA	Water	8260B	
MB 240-513905/6	Method Blank	Total/NA	Water	8260B	
LCS 240-513905/4	Lab Control Sample	Total/NA	Water	8260B	
240-160150-2 MS	MW-146S_111221	Total/NA	Water	8260B	
240-160150-2 MSD	MW-146S_111221	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160150-1

Client Sample ID: TRIP BLANK_127

Lab Sample ID: 240-160150-1

Date Collected: 11/12/21 00:00

Matrix: Water

Date Received: 11/16/21 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513905	11/20/21 04:43	LEE	TAL CAN

Client Sample ID: MW-146S_111221

Lab Sample ID: 240-160150-2

Date Collected: 11/12/21 13:50

Matrix: Water

Date Received: 11/16/21 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513905	11/20/21 05:05	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513700	11/19/21 02:19	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160150-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	DW / NPDES / RCRA / Other	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500		Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377		Sampler Name: Sam Hindle / COURTIER, CHRISTINA WEAVER	TAT if different from below: 10 day; ✓ 2 weeks; 3 weeks; 1 week; 2 days; 1 day		Walk-in client
Phone: 248-994-2240		Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site		Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04					
PO # 30080642.402.04					

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_127	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-146S_11121	11/12/21	13 50		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-160150 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / ✓ Disposal By Lab / Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: SH	Arcadis	11/12/21 15 15	Received by: Non cold storage	Arcadis	11/12/21 15 15
Relinquished by:	ARCADIS	11/15/21	Received by:	ETA	11/15/21 1300
Relinquished by:	ETA	11/15/21 1300	Received in Laboratory by:	ETA	11-16-21 10:15

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12/3/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 160150**
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Tammy Boger

Cooler Received on 11-16-21 Opened on 11-16-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.8 °C Corrected Cooler Temp. 0.9 °C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2 Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6 Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?	Yes	No
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# **HC157842**
14. Were VOAs on the COC?	Yes	No
15 Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 60358	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

FB

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

No SIM on TB per Corrected COC. JMB 11/16/21

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired

Sample(s) _____ were received in a broken container

Sample(s) _____ were received with bubble >6 mm in diameter (Notify PM)

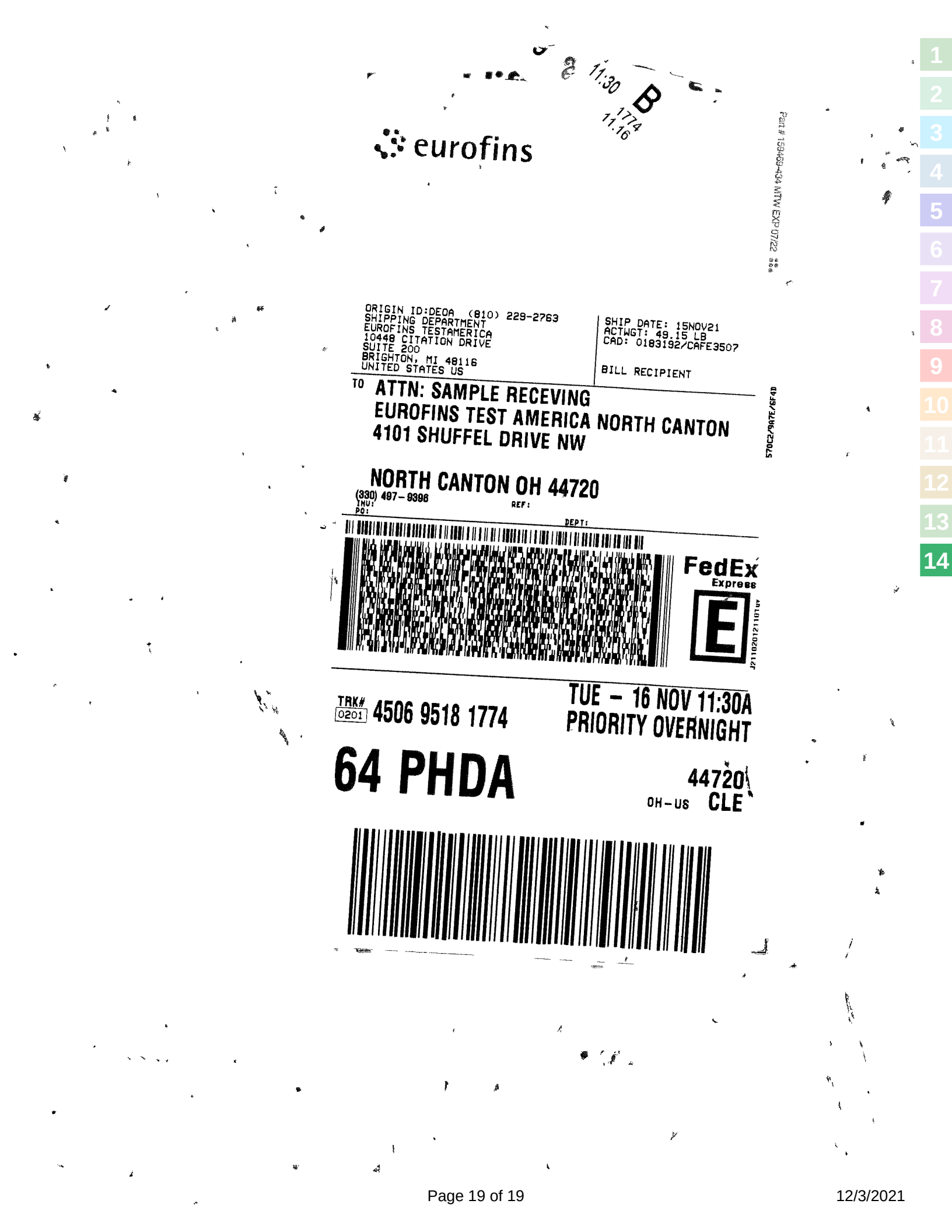
20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory

Time preserved. _____ Preservative(s) added/Lot number(s). _____

VOA Sample Preservation - Date/Time VOAs Frozen _____

WI-NC-099


eurofins
11:30
B
1774
11.16
Part # 159469-434 MTW EXP 07/22
ORIGIN ID:DEOA (810) 229-2763
SHIPPING DEPARTMENT
EUROFINS TESTAMERICA
10448 CITATION DRIVE
SUITE 200
BRIGHTON, MI 48116
UNITED STATES US
SHIP DATE: 15NOV21
ACTWGT: 49.15 LB
CAD: 0183192/CAFE3507
BILL RECIPIENT
TO ATTN: SAMPLE RECEVING
EUROFINS TEST AMERICA NORTH CANTON
4101 SHUFFEL DRIVE NW
NORTH CANTON OH 44720
(330) 497-9396
INV:
PO:
REF:
DEPT:
570C2/9B7E/6F4D
FedEx
Express
J211020121101uv
TRK# 0201 4506 9518 1774
TUE - 16 NOV 11:30A
PRIORITY OVERNIGHT
64 PHDA
44720
OH-US CLE

DATA VERIFICATION REPORT

December 04, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 160150-1
Sample date: 2021-11-12
Report received by CADENA: 2021-12-03
Initial Data Verification completed by CADENA: 2021-12-04
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC sample -002 MS/MSD RPD only were outliers for CIS-1,2-DICHLOROETHENE so client sample results were not qualified based on this QC outlier alone.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, MS/MSD Recovery, MS/MSD RPD, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 160150-1

		Sample Name:	TRIP BLANK_127				MW-146S_111221			
		Lab Sample ID:	2401601501				2401601502			
		Sample Date:	11/12/2021				11/12/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

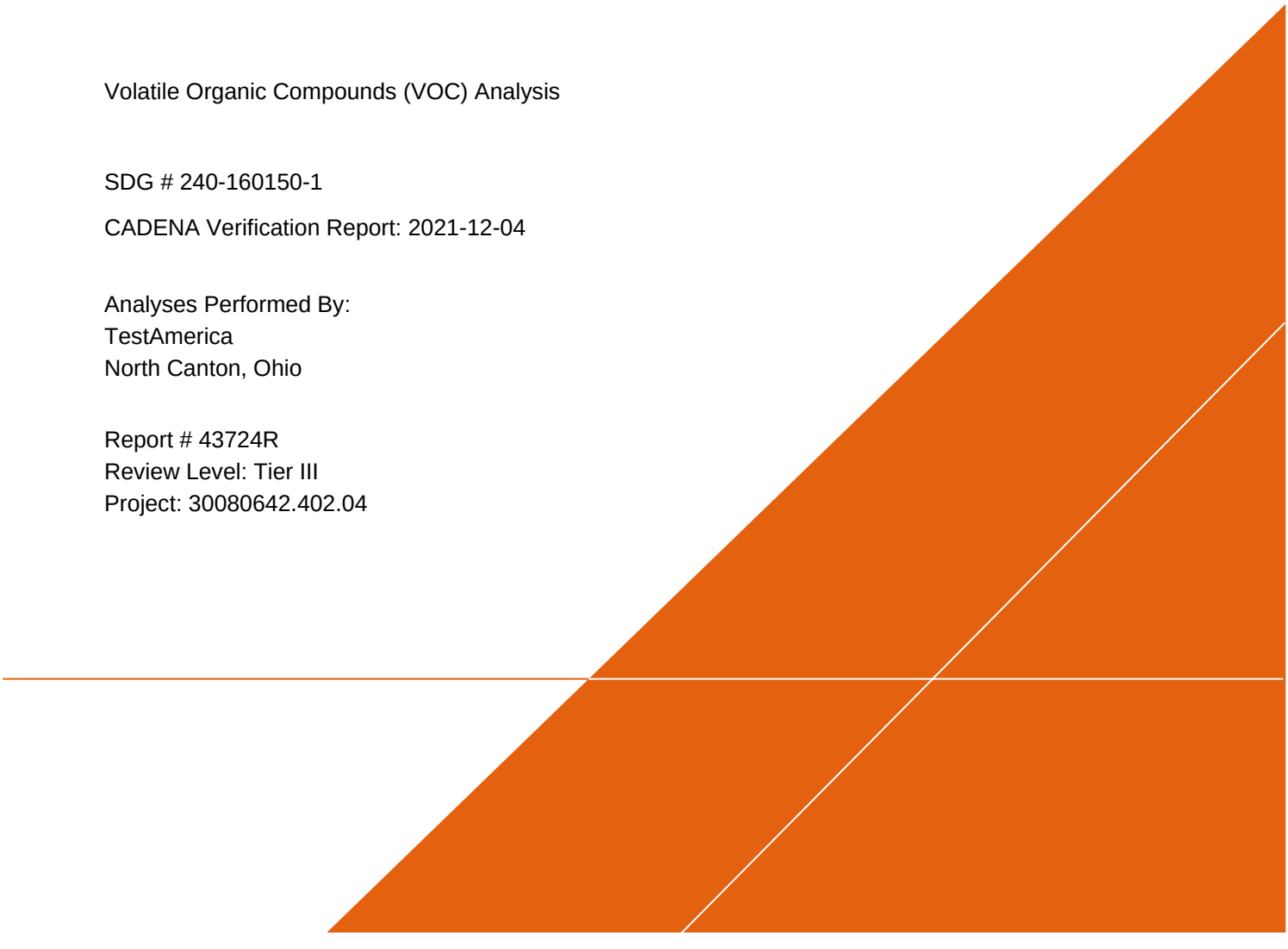
Volatile Organic Compounds (VOC) Analysis

SDG # 240-160150-1

CADENA Verification Report: 2021-12-04

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43724R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-160150-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_127	240-160150-1	Water	11/12/21		X	
MW-146S_111221	240-160150-2	Water	11/12/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Sam Hindal / COURIER. CHRISTINA WEAVER	TAT if different from below: 10 day ✓ 2 weeks; 3 weeks; 1 week; 2 days; 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_127	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-146S_111221	11/12/21	1350		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-160150 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Return to Client ✓ Disposal By Lab Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: SH	Arcadis	11/12/21 15 15	Received by: Non cold storage	Arcadis	11/12/21 15 15
Relinquished by:	ARCADIS	11/15/21	Received by:	ETA	11/15/21 1300
Relinquished by:	ETA	11/15/21 1300	Received in Laboratory by:	ETA	11-16-21 10:15

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Client Sample ID: TRIP BLANK_127
Lab Sample ID: 240-160150-1
Date Collected: 11/12/21 00:00
Matrix: Water
Date Received: 11/16/21 10:15

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 04:43	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 04:43	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 04:43	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 04:43	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 04:43	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 04:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*		*11/20/21 04:43*	*1*
4-Bromofluorobenzene (Surr)	*76*		*56 - 136*		*11/20/21 04:43*	*1*
Toluene-d8 (Surr)	*107*		*78 - 122*		*11/20/21 04:43*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*11/20/21 04:43*	*1*

Client Sample ID: MW-146S_111221
Lab Sample ID: 240-160150-2
Date Collected: 11/12/21 13:50
Matrix: Water
Date Received: 11/16/21 10:15

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/19/21 02:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*		*11/19/21 02:19*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 05:05	1
cis-1,2-Dichloroethene	1.0	U F2	1.0	0.46	ug/L			11/20/21 05:05	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 05:05	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 05:05	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 05:05	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 05:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*62 - 137*		*11/20/21 05:05*	*1*
4-Bromofluorobenzene (Surr)	*74*		*56 - 136*		*11/20/21 05:05*	*1*
Toluene-d8 (Surr)	*113*		*78 - 122*		*11/20/21 05:05*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/20/21 05:05*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159714-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/24/2021 8:24:35 AM

Michael DelMonico, Project Manager I
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Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159714-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
E	Result exceeded calibration range.
F1	MS and/or MSD recovery exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159714-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159714-1

Comments
No additional comments.

Receipt
The samples were received on 11/10/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 0.7º C and 0.8º C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) for analytical batch 513964 exceeded control criteria for 1,1-Dichloroethene. The samples associated with this CCV were non-detect for the affected analytes. In accordance with the laboratory SOP, a low level CCV at the reporting limit (labeled as an MRL) was analyzed and the affected compounds were detected; therefore the data has been reported. No further corrective action was required: TRIP BLANK_79 (240-159714-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159714-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159714-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159714-1	TRIP BLANK_79	Water	11/08/21 00:00	11/10/21 08:00
240-159714-2	MW-150S_110821	Water	11/08/21 12:45	11/10/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159714-1

Client Sample ID: TRIP BLANK_79 — Lab Sample ID: 240-159714-1

No Detections.

Client Sample ID: MW-150S_110821 — Lab Sample ID: 240-159714-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	0.95	J	1.0	0.45	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159714-1

Client Sample ID: TRIP BLANK_79
Date Collected: 11/08/21 00:00
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159714-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 16:02	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 16:02	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 16:02	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 16:02	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 16:02	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 16:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*62 - 137*		*11/20/21 16:02*	*1*
4-Bromofluorobenzene (Surr)	*67*		*56 - 136*		*11/20/21 16:02*	*1*
Toluene-d8 (Surr)	*88*		*78 - 122*		*11/20/21 16:02*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/20/21 16:02*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159714-1

Client Sample ID: MW-150S_110821
Date Collected: 11/08/21 12:45
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159714-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 01:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*76*		*66 - 120*		*11/18/21 01:57*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 16:28	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 16:28	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 16:28	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 16:28	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 16:28	1
Vinyl chloride	**0.95**	**J**	1.0	0.45	ug/L			11/17/21 16:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*111*		*62 - 137*		*11/17/21 16:28*	*1*
4-Bromofluorobenzene (Surr)	*68*		*56 - 136*		*11/17/21 16:28*	*1*
Toluene-d8 (Surr)	*86*		*78 - 122*		*11/17/21 16:28*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*11/17/21 16:28*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159714-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159714-1	TRIP BLANK_79	119	67	88	100
240-159714-2	MW-150S_110821	111	68	86	95
240-159724-A-2 MS	Matrix Spike	96	99	103	84
240-159724-C-2 MSD	Matrix Spike Duplicate	97	97	106	86
240-159893-E-4 MSD	Matrix Spike Duplicate	98	97	104	83
240-159893-H-4 MS	Matrix Spike	99	95	103	86
LCS 240-513417/4	Lab Control Sample	93	97	98	84
LCS 240-513964/4	Lab Control Sample	99	97	103	84
MB 240-513417/7	Method Blank	105	76	89	91
MB 240-513964/7	Method Blank	118	72	88	96

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159636-H-2 MS	Matrix Spike	77
240-159636-N-2 MSD	Matrix Spike Duplicate	77
240-159714-2	MW-150S_110821	76
LCS 240-513479/4	Lab Control Sample	78
MB 240-513479/5	Method Blank	77

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513417/7
Matrix: Water
Analysis Batch: 513417

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 13:33	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 13:33	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 13:33	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 13:33	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 13:33	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 13:33	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/17/21 13:33*	*1*
4-Bromofluorobenzene (Surr)	*76*		*56 - 136*		*11/17/21 13:33*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/17/21 13:33*	*1*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*11/17/21 13:33*	*1*

Lab Sample ID: LCS 240-513417/4
Matrix: Water
Analysis Batch: 513417

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.24		ug/L		92	63 - 134
cis-1,2-Dichloroethene	10.0	9.72		ug/L		97	77 - 123
Tetrachloroethene	10.0	9.53		ug/L		95	76 - 123
trans-1,2-Dichloroethene	10.0	10.1		ug/L		101	75 - 124
Trichloroethene	10.0	8.80		ug/L		88	70 - 122
Vinyl chloride	10.0	11.6		ug/L		116	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*97*		*56 - 136*
Toluene-d8 (Surr)	*98*		*78 - 122*
Dibromofluoromethane (Surr)	*84*		*73 - 120*

Lab Sample ID: 240-159724-A-2 MS
Matrix: Water
Analysis Batch: 513417

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	8.39		ug/L		84	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	8.85		ug/L		88	66 - 128
Tetrachloroethene	1.0	U	10.0	8.96		ug/L		90	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.58		ug/L		96	56 - 136
Trichloroethene	1.0	U	10.0	7.89		ug/L		79	61 - 124
Vinyl chloride	2.8		10.0	14.2		ug/L		114	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*
4-Bromofluorobenzene (Surr)	*99*		*56 - 136*
Toluene-d8 (Surr)	*103*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159724-A-2 MS
Matrix: Water
Analysis Batch: 513417

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	*84*		*73 - 120*

Lab Sample ID: 240-159724-C-2 MSD
Matrix: Water
Analysis Batch: 513417

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	7.80		ug/L		78	56 - 135	7	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.45		ug/L		95	66 - 128	7	14
Tetrachloroethene	1.0	U	10.0	9.27		ug/L		93	62 - 131	3	20
trans-1,2-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	56 - 136	8	15
Trichloroethene	1.0	U	10.0	8.32		ug/L		83	61 - 124	5	15
Vinyl chloride	2.8		10.0	15.8		ug/L		130	43 - 157	11	24

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*97*		*62 - 137*
4-Bromofluorobenzene (Surr)	*97*		*56 - 136*
Toluene-d8 (Surr)	*106*		*78 - 122*
Dibromofluoromethane (Surr)	*86*		*73 - 120*

Lab Sample ID: MB 240-513964/7
Matrix: Water
Analysis Batch: 513964

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 15:18	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 15:18	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 15:18	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 15:18	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 15:18	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 15:18	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*118*		*62 - 137*		*11/20/21 15:18*	*1*
4-Bromofluorobenzene (Surr)	*72*		*56 - 136*		*11/20/21 15:18*	*1*
Toluene-d8 (Surr)	*88*		*78 - 122*		*11/20/21 15:18*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/20/21 15:18*	*1*

Lab Sample ID: LCS 240-513964/4
Matrix: Water
Analysis Batch: 513964

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.36		ug/L		84	63 - 134
cis-1,2-Dichloroethene	10.0	9.27		ug/L		93	77 - 123
Tetrachloroethene	10.0	8.94		ug/L		89	76 - 123
trans-1,2-Dichloroethene	10.0	10.1		ug/L		101	75 - 124
Trichloroethene	10.0	8.15		ug/L		81	70 - 122

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-513964/4
Matrix: Water
Analysis Batch: 513964

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Vinyl chloride			10.0	8.34		ug/L		83	60 - 144		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*
4-Bromofluorobenzene (Surr)	*97*		*56 - 136*
Toluene-d8 (Surr)	*103*		*78 - 122*
Dibromofluoromethane (Surr)	*84*		*73 - 120*

Lab Sample ID: 240-159893-E-4 MSD
Matrix: Water
Analysis Batch: 513964

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
cis-1,2-Dichloroethene	33	F1	10.0	37.7	F1	ug/L		42	66 - 128	2	14
Tetrachloroethene	1.0	U	10.0	8.34		ug/L		83	62 - 131	1	20
trans-1,2-Dichloroethene	0.57	J	10.0	9.77		ug/L		92	56 - 136	3	15
Trichloroethene	43	E	10.0	42.9	E 4	ug/L		0.8	61 - 124	0	15
Vinyl chloride	0.61	J	10.0	8.59		ug/L		80	43 - 157	0	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*
4-Bromofluorobenzene (Surr)	*97*		*56 - 136*
Toluene-d8 (Surr)	*104*		*78 - 122*
Dibromofluoromethane (Surr)	*83*		*73 - 120*

Lab Sample ID: 240-159893-H-4 MS
Matrix: Water
Analysis Batch: 513964

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
cis-1,2-Dichloroethene	33	F1	10.0	38.4	F1	ug/L		50	66 - 128		
Tetrachloroethene	1.0	U	10.0	8.39		ug/L		84	62 - 131		
trans-1,2-Dichloroethene	0.57	J	10.0	10.1		ug/L		95	56 - 136		
Trichloroethene	43	E	10.0	43.1	E 4	ug/L		2	61 - 124		
Vinyl chloride	0.61	J	10.0	8.60		ug/L		80	43 - 157		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*
4-Bromofluorobenzene (Surr)	*95*		*56 - 136*
Toluene-d8 (Surr)	*103*		*78 - 122*
Dibromofluoromethane (Surr)	*86*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513479/5
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 17:41	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*		*11/17/21 17:41*	*1*

Lab Sample ID: LCS 240-513479/4
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	11.9		ug/L		119	80 - 122		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*

Lab Sample ID: 240-159636-H-2 MS
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

Lab Sample ID: 240-159636-N-2 MSD
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153	0	16

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159714-1

GC/MS VOA

Analysis Batch: 513417

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159714-2	MW-150S_110821	Total/NA	Water	8260B	
MB 240-513417/7	Method Blank	Total/NA	Water	8260B	
LCS 240-513417/4	Lab Control Sample	Total/NA	Water	8260B	
240-159724-A-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159724-C-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 513479

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159714-2	MW-150S_110821	Total/NA	Water	8260B SIM	
MB 240-513479/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513479/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159636-H-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159636-N-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513964

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159714-1	TRIP BLANK_79	Total/NA	Water	8260B	
MB 240-513964/7	Method Blank	Total/NA	Water	8260B	
LCS 240-513964/4	Lab Control Sample	Total/NA	Water	8260B	
240-159893-E-4 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	
240-159893-H-4 MS	Matrix Spike	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159714-1

Client Sample ID: TRIP BLANK_79

Lab Sample ID: 240-159714-1

Date Collected: 11/08/21 00:00

Matrix: Water

Date Received: 11/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513964	11/20/21 16:02	LEE	TAL CAN

Client Sample ID: MW-150S_110821

Lab Sample ID: 240-159714-2

Date Collected: 11/08/21 12:45

Matrix: Water

Date Received: 11/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513417	11/17/21 16:28	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513479	11/18/21 01:57	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159714-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	TAT if different from below		Walk-in client
Phone: 248-994-2240	Sampler Name: Sommer Guy	10 day ✓ 2 weeks; 3 weeks; 1 week; 2 days; 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30080642.402.04	Shipping/Tracking No:			
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_79	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1505-110821	11/8/21	12:45		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159714 Chain of Custody

Possible Hazard Identification
✓ Non-Hazard — Flammable — Skin Irritant — Poison B — Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
— Return to Client ✓ Disposal By Lab — Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Sommer Guy	Arcadis	11/8/21 15:30	Novi Cold Storage	Arcadis	11/8/21 15:30
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	ARCADIS	11/9/21 1040	[signature]	ETA	11/9/21 1040
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
[signature]	ETA	11/9/21 1055	[signature]	ETA	11-10-21 8:00

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11/24/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** _____
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Marilyn Beaver

Cooler Received on 11-10-21 Opened on 11-10-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity_____	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC157842
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #_____	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

No SIM on TB via corrected COC

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

WI-NC-099

Login # : _____

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form				
Cooler Description (Circle)	**IR Gun # (Circle)**	**Observed Temp °C**	**Corrected Temp °C**	**Coolant (Circle)**
TA Client Box Other	IR-14 IR-15	0-6	0-7	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15	0-7	0-8	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15	

DATA VERIFICATION REPORT



November 25, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159714-1
Sample date: 2021-11-08
Report received by CADENA: 2021-11-24
Initial Data Verification completed by CADENA: 2021-11-25
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

MS/MSD recovery outliers or sample duplicate RPD outliers were not determined using a client sample from this submittal for the test and QC batch noted so qualification was not required based on these sample-specific QC outliers:
GCMS VOC QC batch 513964.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159714-1

		Sample Name:	TRIP BLANK_79				MW-150S_110821			
		Lab Sample ID:	2401597141				2401597142			
		Sample Date:	11/8/2021				11/8/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	0.95	1.0	ug/l	J
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

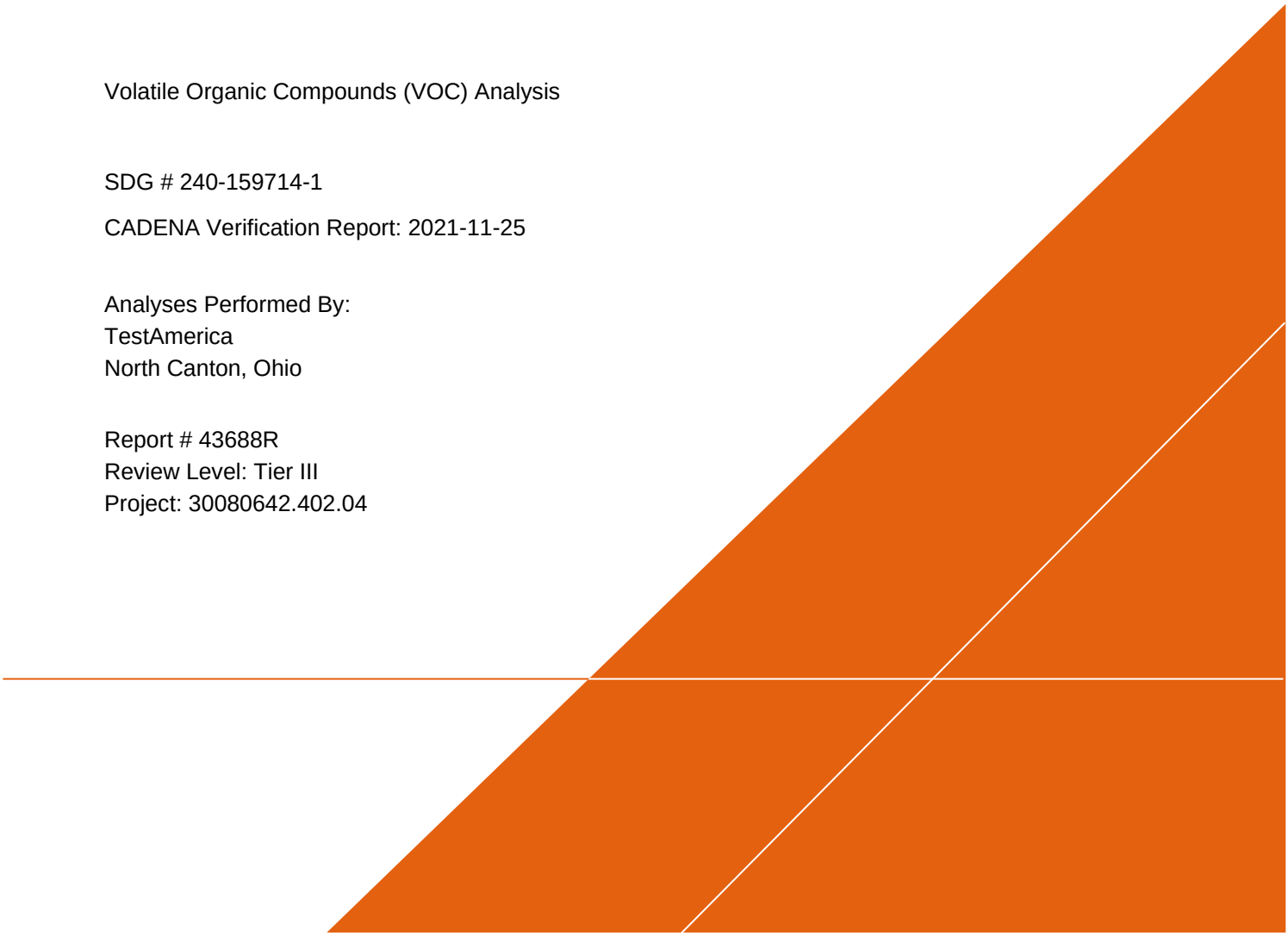
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159714-1

CADENA Verification Report: 2021-11-25

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43688R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159714-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_79	240-159714-1	Water	11/08/21		X	
MW-150S_110821	240-159714-2	Water	11/08/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Compound	Criteria
TRIP BLANK_79	Continuous Calibration Verification %D	1,1-Dichloroethene	-35.3%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	

Initial/Continuing	Criteria	Sample Result	Qualification
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 10, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 14, 2021

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No: 1 of 1 COCs
Phone: 248-994-2240	Sampler Name: Sommer Guy	TAT if different from below: 10 day; 3 weeks / 2 weeks / 1 week / 2 days / 1 day	For lab use only: Walk-in client; Lab sampling; Job/SDG No:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30080642.402.04	Shipping/Tracking No:		
PO # 30080642.402.04			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_79	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1505-110821	11/8/21	12:45		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159714 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Sommer Guy	Arcadis	11/8/21 15:30	Novi Cold Storage	Arcadis	11/8/21 15:30
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[illegible]	ARCADIS	11/9/21 1040	[illegible]	ETA	111921 1040
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
[illegible]	ETA	11/9/21 1055	[illegible]	ETA	11-10-21 8:00

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Client Sample ID: TRIP BLANK_79
Lab Sample ID: 240-159714-1
Date Collected: 11/08/21 00:00
Matrix: Water
Date Received: 11/10/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	~~U~~ UJ	1.0	0.49	ug/L			11/20/21 16:02	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 16:02	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 16:02	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 16:02	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 16:02	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 16:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*62 - 137*		*11/20/21 16:02*	*1*
4-Bromofluorobenzene (Surr)	*67*		*56 - 136*		*11/20/21 16:02*	*1*
Toluene-d8 (Surr)	*88*		*78 - 122*		*11/20/21 16:02*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/20/21 16:02*	*1*

Client Sample ID: MW-150S_110821
Lab Sample ID: 240-159714-2
Date Collected: 11/08/21 12:45
Matrix: Water
Date Received: 11/10/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 01:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*76*		*66 - 120*		*11/18/21 01:57*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 16:28	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 16:28	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 16:28	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 16:28	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 16:28	1
Vinyl chloride	**0.95**	**J**	1.0	0.45	ug/L			11/17/21 16:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*111*		*62 - 137*		*11/17/21 16:28*	*1*
4-Bromofluorobenzene (Surr)	*68*		*56 - 136*		*11/17/21 16:28*	*1*
Toluene-d8 (Surr)	*86*		*78 - 122*		*11/17/21 16:28*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*11/17/21 16:28*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159955-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/29/2021 8:30:31 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
Review your project results through TotalAccess
Have a Question? Ask The Expert
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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159955-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159955-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159955-1

Comments
No additional comments.

Receipt
The samples were received on 11/12/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.6º C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) associated with batch 513804 recovered above the upper control limit for Vinyl Chloride. The samples associated with this CCV were non-detect for the affected analyte; therefore, the data have been reported. The associated samples are impacted: TRIP BLANK_111 (240-159955-1) and MW-90S_111021 (240-159955-2).

Method 8260B: The laboratory control sample (LCS) for 513804 recovered outside control limits for Tetrachloroethene. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159955-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159955-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159955-1	TRIP BLANK_111	Water	11/10/21 00:00	11/12/21 08:00
240-159955-2	MW-90S_111021	Water	11/10/21 13:35	11/12/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159955-1

Client Sample ID: TRIP BLANK_111 — Lab Sample ID: 240-159955-1

No Detections.

Client Sample ID: MW-90S_111021 — Lab Sample ID: 240-159955-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159955-1

Client Sample ID: TRIP BLANK_111
Date Collected: 11/10/21 00:00
Date Received: 11/12/21 08:00

Lab Sample ID: 240-159955-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 17:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 17:52	1
Tetrachloroethene	1.0	U *+	1.0	0.44	ug/L			11/19/21 17:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 17:52	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 17:52	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 17:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*		*11/19/21 17:52*	*1*
4-Bromofluorobenzene (Surr)	*72*		*56 - 136*		*11/19/21 17:52*	*1*
Toluene-d8 (Surr)	*111*		*78 - 122*		*11/19/21 17:52*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*11/19/21 17:52*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159955-1

Client Sample ID: MW-90S_111021
Date Collected: 11/10/21 13:35
Date Received: 11/12/21 08:00

Lab Sample ID: 240-159955-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 03:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*		*11/18/21 03:08*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 18:15	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 18:15	1
Tetrachloroethene	1.0	U *+	1.0	0.44	ug/L			11/19/21 18:15	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 18:15	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 18:15	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 18:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/19/21 18:15*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/19/21 18:15*	*1*
Toluene-d8 (Surr)	*115*		*78 - 122*		*11/19/21 18:15*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*11/19/21 18:15*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159955-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159953-A-2 MS	Matrix Spike	100	85	115	96
240-159953-D-2 MSD	Matrix Spike Duplicate	99	87	112	92
240-159955-1	TRIP BLANK_111	98	72	111	92
240-159955-2	MW-90S_111021	99	70	115	92
LCS 240-513804/4	Lab Control Sample	100	87	118	98
MB 240-513804/6	Method Blank	105	81	118	101

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159642-H-3 MS	Matrix Spike	87
240-159642-M-3 MSD	Matrix Spike Duplicate	87
240-159955-2	MW-90S_111021	87
LCS 240-513480/3	Lab Control Sample	84
MB 240-513480/4	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513804/6
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 15:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 15:38	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 15:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 15:38	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 15:38	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 15:38	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/19/21 15:38*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/19/21 15:38*	*1*
Toluene-d8 (Surr)	*118*		*78 - 122*		*11/19/21 15:38*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/19/21 15:38*	*1*

Lab Sample ID: LCS 240-513804/4
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	11.0		ug/L		110	63 - 134
cis-1,2-Dichloroethene	10.0	11.0		ug/L		110	77 - 123
Tetrachloroethene	10.0	13.0	*+	ug/L		130	76 - 123
trans-1,2-Dichloroethene	10.0	10.8		ug/L		108	75 - 124
Trichloroethene	10.0	9.54		ug/L		95	70 - 122
Vinyl chloride	10.0	11.1		ug/L		111	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*118*		*78 - 122*
Dibromofluoromethane (Surr)	*98*		*73 - 120*

Lab Sample ID: 240-159953-A-2 MS
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	10.3		ug/L		103	66 - 128
Tetrachloroethene	1.0	U *+	10.0	10.2		ug/L		102	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	56 - 136
Trichloroethene	1.0	U	10.0	8.59		ug/L		86	61 - 124
Vinyl chloride	1.0	U	10.0	10.2		ug/L		102	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*
Toluene-d8 (Surr)	*115*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159953-A-2 MS
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	96		73 - 120

Lab Sample ID: 240-159953-D-2 MSD
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.86		ug/L		99	56 - 135	5	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.79		ug/L		98	66 - 128	5	14
Tetrachloroethene	1.0	U *+	10.0	9.63		ug/L		96	62 - 131	6	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.82		ug/L		98	56 - 136	5	15
Trichloroethene	1.0	U	10.0	8.28		ug/L		83	61 - 124	4	15
Vinyl chloride	1.0	U	10.0	10.7		ug/L		107	43 - 157	5	24

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	99		62 - 137
4-Bromofluorobenzene (Surr)	87		56 - 136
Toluene-d8 (Surr)	112		78 - 122
Dibromofluoromethane (Surr)	92		73 - 120

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513480/4
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 19:58	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	84		66 - 120		11/17/21 19:58	1

Lab Sample ID: LCS 240-513480/3
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.37		ug/L		94	80 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	84		66 - 120

Lab Sample ID: 240-159642-H-3 MS
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.3		ug/L		103	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

Lab Sample ID: 240-159642-M-3 MSD
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.57		ug/L		96	51 - 153	7	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159955-1

GC/MS VOA

Analysis Batch: 513480

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159955-2	MW-90S_111021	Total/NA	Water	8260B SIM	
MB 240-513480/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513480/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159642-H-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159642-M-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513804

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159955-1	TRIP BLANK_111	Total/NA	Water	8260B	
240-159955-2	MW-90S_111021	Total/NA	Water	8260B	
MB 240-513804/6	Method Blank	Total/NA	Water	8260B	
LCS 240-513804/4	Lab Control Sample	Total/NA	Water	8260B	
240-159953-A-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159953-D-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159955-1

Client Sample ID: TRIP BLANK_111

Lab Sample ID: 240-159955-1

Date Collected: 11/10/21 00:00

Matrix: Water

Date Received: 11/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513804	11/19/21 17:52	LEE	TAL CAN

Client Sample ID: MW-90S_111021

Lab Sample ID: 240-159955-2

Date Collected: 11/10/21 13:35

Matrix: Water

Date Received: 11/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513804	11/19/21 18:15	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513480	11/18/21 03:08	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159955-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

HIGAN '99

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	DW NPDES RCRA Other	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500		Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377		Sampler Name: Sommer Guy	TAT if different from below		Walk-in client
Phone: 248-994-2240		Method of Shipment/Carrier:	10 day ✓ 2 weeks / 3 weeks / 1 week / 2 days / 1 day		Lab sampling
Project Name: Ford LTP Off-Site		Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04					
PO # 30080642.402.04					

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 111	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-905-111021	11/10/21	13:35		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159955 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client ✓ Disposal By Lab Archive For [ ] Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com Cadena #E203631
Level IV Reporting requested

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
Sommer Guy	Arcadis	11/10/21 16:00	Novi Cold Storage	Arcadis	11/10/21 16:00
Relinquished by:	Company: ARCADIS	Date/Time: 11/11/21 0950	Received by: Jeri Hall	Company: ETA	Date/Time: 11/11/21 0950
Relinquished by: Jeri Hall	Company: ETA	Date/Time: 11-11-21 1046	Received in Laboratory by: M. L. L.	Company: ETA	Date/Time: 11/12/21 8:30

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11/29/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159955**
Canton Facility

Client Arcadis Site Name

Cooler Received on 11/12/21 Opened on 11/12/21

Cooler unpacked by: Matthew Surma

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.5 °C Corrected Cooler Temp. 0.6 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2 Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes) No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes) No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes (No)
-Were tamper/custody seals intact and uncompromised?	(Yes) No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes (No)
4. Did custody papers accompany the sample(s)?	(Yes) No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes) No m.s.j.
7. Did all bottles arrive in good condition (Unbroken)?	(Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?	
10. Were correct bottle(s) used for the test(s) indicated?	(Yes) No
11. Sufficient quantity received to perform indicated analyses?	(Yes) No
12. Are these work share samples and all listed on the COC?	Yes (No)
If yes, Questions 13-17 have been checked at the originating laboratory.	
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No (NA) pH Strip Lot# HC157842
14. Were VOAs on the COC?	(Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ____	(Yes) No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

NO SIM on TB per Corrected COC. DMR 11/12/21

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

November 29, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159955-1
Sample date: 2021-11-10
Report received by CADENA: 2021-11-29
Initial Data Verification completed by CADENA: 2021-11-29
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 513804 LCS recovery was outlying biased high for the following analyte: TETRACHLOROETHENE. Associated client sample results were non-detect so qualification was not required based on this high bias QC outlier.

GCMS VOC QC batch CCV response outliers as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159955-1

		Sample Name:	TRIP BLANK_111				MW-90S_111021			
		Lab Sample ID:	2401599551				2401599552			
		Sample Date:	11/10/2021				11/10/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

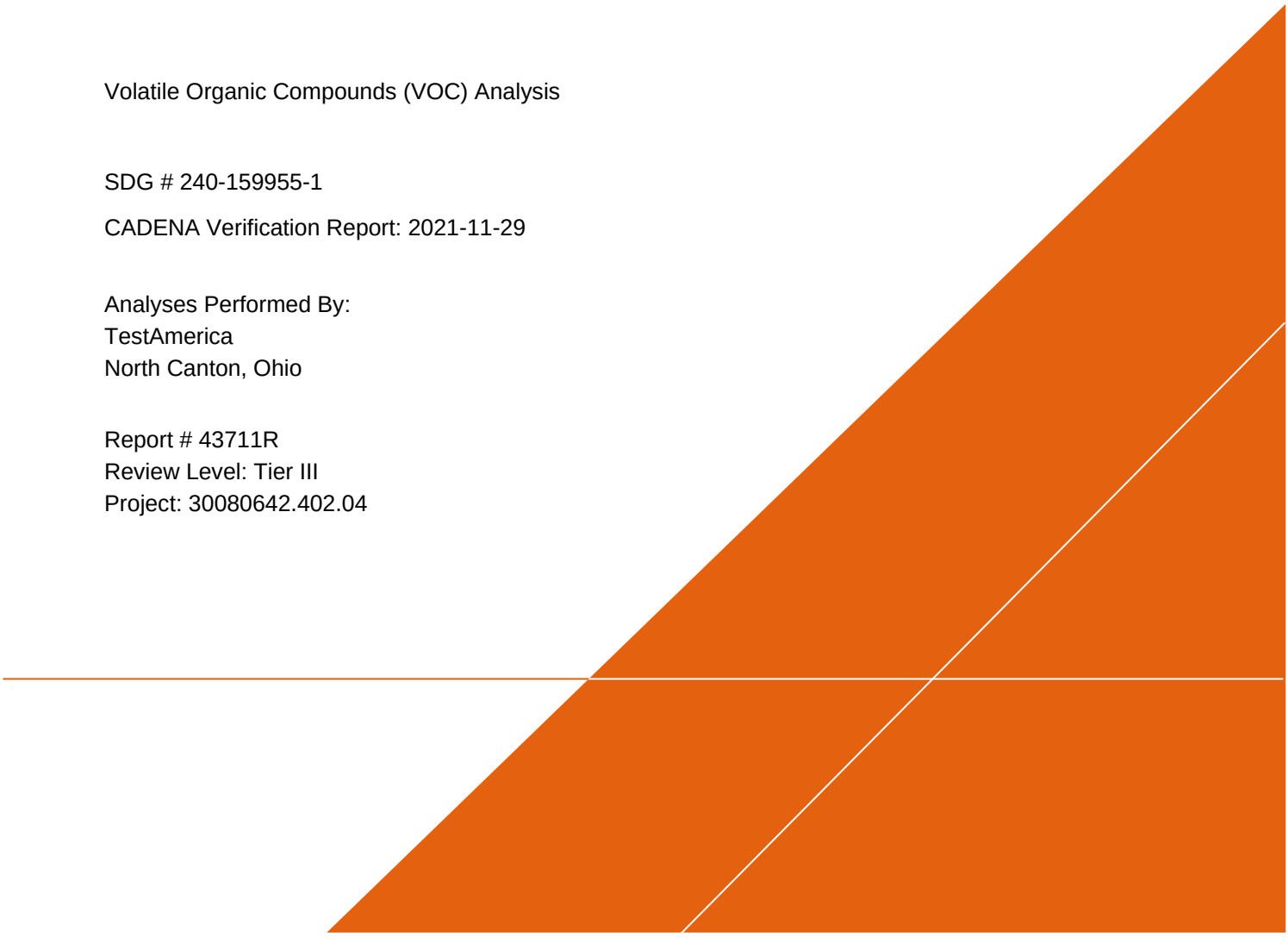
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159955-1

CADENA Verification Report: 2021-11-29

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43711R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159955-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_111	240-159955-1	Water	11/10/21		X	
MW-90S_111021	240-159955-2	Water	11/10/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Compound	Criteria
TRIP BLANK_111 MW-90S_111021	Continuous Calibration Verification %D	Vinyl chloride	+30.0%
		cis-1,2-Dichloroethene	+20.5%
		Tetrachloroethene	+21.1%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J

Initial/Continuing	Criteria	Sample Result	Qualification
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

HIGAN
'99

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Regulatory program: — DW — NPDES RCRA Other

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Sommer Guy	TAT if different from below		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:	10 day ✓ 2 weeks / 3 weeks / 1 week / 2 days / 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_111	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-905-111021	11/10/21	13:35		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159955 Chain of Custody

Possible Hazard Identification
✓ Non-Hazard — Flammable — Skin Irritant — Poison B — Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Return to Client ✓ Disposal ByLab Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com Cadena #E203631
Level IV Reporting requested

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
Sommer Guy	Arcadis	11/10/21 16:00	Novi Cold Storage	Arcadis	11/10/21 16:00
Relinquished by:	Company: ARCADIS	Date/Time: 11/11/21 / 0950	Received by:	Company: ETA	Date/Time: 11/11/21 0950
Relinquished by:	Company: ETA	Date/Time: 11-11-21 1046	Received in Laboratory by: M. A. A.	Company: ETA	Date/Time: 11/12/21 8:30

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Client Sample ID: TRIP BLANK_111
Lab Sample ID: 240-159955-1
Date Collected: 11/10/21 00:00
Matrix: Water
Date Received: 11/12/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 17:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 17:52	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 17:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 17:52	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 17:52	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 17:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*		*11/19/21 17:52*	*1*
4-Bromofluorobenzene (Surr)	*72*		*56 - 136*		*11/19/21 17:52*	*1*
Toluene-d8 (Surr)	*111*		*78 - 122*		*11/19/21 17:52*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*11/19/21 17:52*	*1*

Client Sample ID: MW-90S_111021
Lab Sample ID: 240-159955-2
Date Collected: 11/10/21 13:35
Matrix: Water
Date Received: 11/12/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 03:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*		*11/18/21 03:08*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 18:15	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 18:15	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 18:15	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 18:15	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 18:15	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 18:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/19/21 18:15*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/19/21 18:15*	*1*
Toluene-d8 (Surr)	*115*		*78 - 122*		*11/19/21 18:15*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*11/19/21 18:15*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-160085-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/29/2021 8:50:22 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160085-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
E	Result exceeded calibration range.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160085-1

Job ID: 240-160085-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-160085-1

Comments
No additional comments.

Receipt
The samples were received on 11/13/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.5º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160085-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160085-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-160085-1	TRIP BLANK_121	Water	11/11/21 00:00	11/13/21 08:00
240-160085-2	MW-147S_111121	Water	11/11/21 12:25	11/13/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160085-1

Client Sample ID: TRIP BLANK_121 — Lab Sample ID: 240-160085-1

No Detections.

Client Sample ID: MW-147S_111121 — Lab Sample ID: 240-160085-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160085-1

Client Sample ID: TRIP BLANK_121

Date Collected: 11/11/21 00:00
Date Received: 11/13/21 08:00

Lab Sample ID: 240-160085-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/22/21 19:30	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/22/21 19:30	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/22/21 19:30	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/22/21 19:30	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/22/21 19:30	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/22/21 19:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*62 - 137*		*11/22/21 19:30*	*1*
4-Bromofluorobenzene (Surr)	*97*		*56 - 136*		*11/22/21 19:30*	*1*
Toluene-d8 (Surr)	*104*		*78 - 122*		*11/22/21 19:30*	*1*
Dibromofluoromethane (Surr)	*113*		*73 - 120*		*11/22/21 19:30*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160085-1

Client Sample ID: MW-147S_111121
Date Collected: 11/11/21 12:25
Date Received: 11/13/21 08:00

Lab Sample ID: 240-160085-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 23:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*		*11/18/21 23:25*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/22/21 21:05	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/22/21 21:05	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/22/21 21:05	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/22/21 21:05	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/22/21 21:05	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/22/21 21:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/22/21 21:05*	*1*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*		*11/22/21 21:05*	*1*
Toluene-d8 (Surr)	*103*		*78 - 122*		*11/22/21 21:05*	*1*
Dibromofluoromethane (Surr)	*112*		*73 - 120*		*11/22/21 21:05*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160085-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159807-B-1 MS	Matrix Spike	101	100	109	115
240-159807-B-1 MSD	Matrix Spike Duplicate	98	99	109	112
240-160085-1	TRIP BLANK_121	101	97	104	113
240-160085-2	MW-147S_111121	105	94	103	112
LCS 240-514100/5	Lab Control Sample	105	102	109	115
MB 240-514100/8	Method Blank	103	98	109	114

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159739-G-3 MS	Matrix Spike	74
240-159739-M-3 MSD	Matrix Spike Duplicate	75
240-160085-2	MW-147S_111121	78
LCS 240-513700/4	Lab Control Sample	75
MB 240-513700/5	Method Blank	77

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-514100/8
Matrix: Water
Analysis Batch: 514100

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/22/21 13:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/22/21 13:57	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/22/21 13:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/22/21 13:57	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/22/21 13:57	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/22/21 13:57	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*		*11/22/21 13:57*	*1*
4-Bromofluorobenzene (Surr)	*98*		*56 - 136*		*11/22/21 13:57*	*1*
Toluene-d8 (Surr)	*109*		*78 - 122*		*11/22/21 13:57*	*1*
Dibromofluoromethane (Surr)	*114*		*73 - 120*		*11/22/21 13:57*	*1*

Lab Sample ID: LCS 240-514100/5
Matrix: Water
Analysis Batch: 514100

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	27.2		ug/L		109	63 - 134
cis-1,2-Dichloroethene	25.0	24.6		ug/L		98	77 - 123
Tetrachloroethene	25.0	26.8		ug/L		107	76 - 123
trans-1,2-Dichloroethene	25.0	25.7		ug/L		103	75 - 124
Trichloroethene	25.0	26.2		ug/L		105	70 - 122
Vinyl chloride	25.0	21.7		ug/L		87	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*
4-Bromofluorobenzene (Surr)	*102*		*56 - 136*
Toluene-d8 (Surr)	*109*		*78 - 122*
Dibromofluoromethane (Surr)	*115*		*73 - 120*

Lab Sample ID: 240-159807-B-1 MS
Matrix: Water
Analysis Batch: 514100

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,2-Dichloroethene	130		83.3	200		ug/L		90	66 - 128
Tetrachloroethene	120		83.3	212	E	ug/L		105	62 - 131
trans-1,2-Dichloroethene	4.3		83.3	89.0		ug/L		102	56 - 136
Trichloroethene	7.8		83.3	94.6		ug/L		104	61 - 124
Vinyl chloride	3.3	U	83.3	68.5		ug/L		82	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*101*		*62 - 137*
4-Bromofluorobenzene (Surr)	*100*		*56 - 136*
Toluene-d8 (Surr)	*109*		*78 - 122*
Dibromofluoromethane (Surr)	*115*		*73 - 120*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159807-B-1 MSD
Matrix: Water
Analysis Batch: 514100

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
cis-1,2-Dichloroethene	130		83.3	197		ug/L		86	66 - 128	1	14
Tetrachloroethene	120		83.3	211	E	ug/L		104	62 - 131	0	20
trans-1,2-Dichloroethene	4.3		83.3	85.6		ug/L		98	56 - 136	4	15
Trichloroethene	7.8		83.3	92.6		ug/L		102	61 - 124	2	15
Vinyl chloride	3.3	U	83.3	69.8		ug/L		84	43 - 157	2	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*
4-Bromofluorobenzene (Surr)	*99*		*56 - 136*
Toluene-d8 (Surr)	*109*		*78 - 122*
Dibromofluoromethane (Surr)	*112*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513700/5
Matrix: Water
Analysis Batch: 513700

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 19:41	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*		*11/18/21 19:41*	*1*

Lab Sample ID: LCS 240-513700/4
Matrix: Water
Analysis Batch: 513700

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.4		ug/L		104	80 - 122		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*

Lab Sample ID: 240-159739-G-3 MS
Matrix: Water
Analysis Batch: 513700

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U F1	10.0	10.4		ug/L		104	51 - 153		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*74*		*66 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159739-M-3 MSD
Matrix: Water
Analysis Batch: 513700

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153	2	16

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160085-1

GC/MS VOA

Analysis Batch: 513700

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-160085-2	MW-147S_111121	Total/NA	Water	8260B SIM	
MB 240-513700/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513700/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159739-G-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159739-M-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 514100

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-160085-1	TRIP BLANK_121	Total/NA	Water	8260B	
240-160085-2	MW-147S_111121	Total/NA	Water	8260B	
MB 240-514100/8	Method Blank	Total/NA	Water	8260B	
LCS 240-514100/5	Lab Control Sample	Total/NA	Water	8260B	
240-159807-B-1 MS	Matrix Spike	Total/NA	Water	8260B	
240-159807-B-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160085-1

Client Sample ID: TRIP BLANK_121

Lab Sample ID: 240-160085-1

Date Collected: 11/11/21 00:00

Matrix: Water

Date Received: 11/13/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	514100	11/22/21 19:30	SAM	TAL CAN

Client Sample ID: MW-147S_111121

Lab Sample ID: 240-160085-2

Date Collected: 11/11/21 12:25

Matrix: Water

Date Received: 11/13/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	514100	11/22/21 21:05	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	513700	11/18/21 23:25	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160085-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

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Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: SOMMER GUY	TAT if different from below: 10 day; 3 weeks, ✓ 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_121	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-147S-111121	11/11/21	12:25		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-160085 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; ✓ Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Sommer Guy	Arcadis	11/11/21 14:30	Novi Cold Storage	Arcadis	11/11/21 14:30
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	ARCADIS	11/12/21 1000		GTA	11/12/21 1000
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
	GTA	11/12/21 1000		GTA	11-12-21 0800

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11/29/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 160085
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Adam Garnett

Cooler Received on 11-13-21 Opened on 11-13-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 1.4 °C Corrected Cooler Temp. 1.5 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
   -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? Yes No
11. Sufficient quantity received to perform indicated analyses? Yes No
12. Are these work share samples and all listed on the COC? Yes No
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# **HC157842**
14. Were VOAs on the COC? Yes No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____ Yes No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

No SIM on TB per corrected CoC.

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

WI-NC-099

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DATA VERIFICATION REPORT

November 29, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 160085-1
Sample date: 2021-11-11
Report received by CADENA: 2021-11-29
Initial Data Verification completed by CADENA: 2021-11-29
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 160085-1

		Sample Name:	TRIP BLANK_121				MW-147S_111121			
		Lab Sample ID:	2401600851				2401600852			
		Sample Date:	11/11/2021				11/11/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

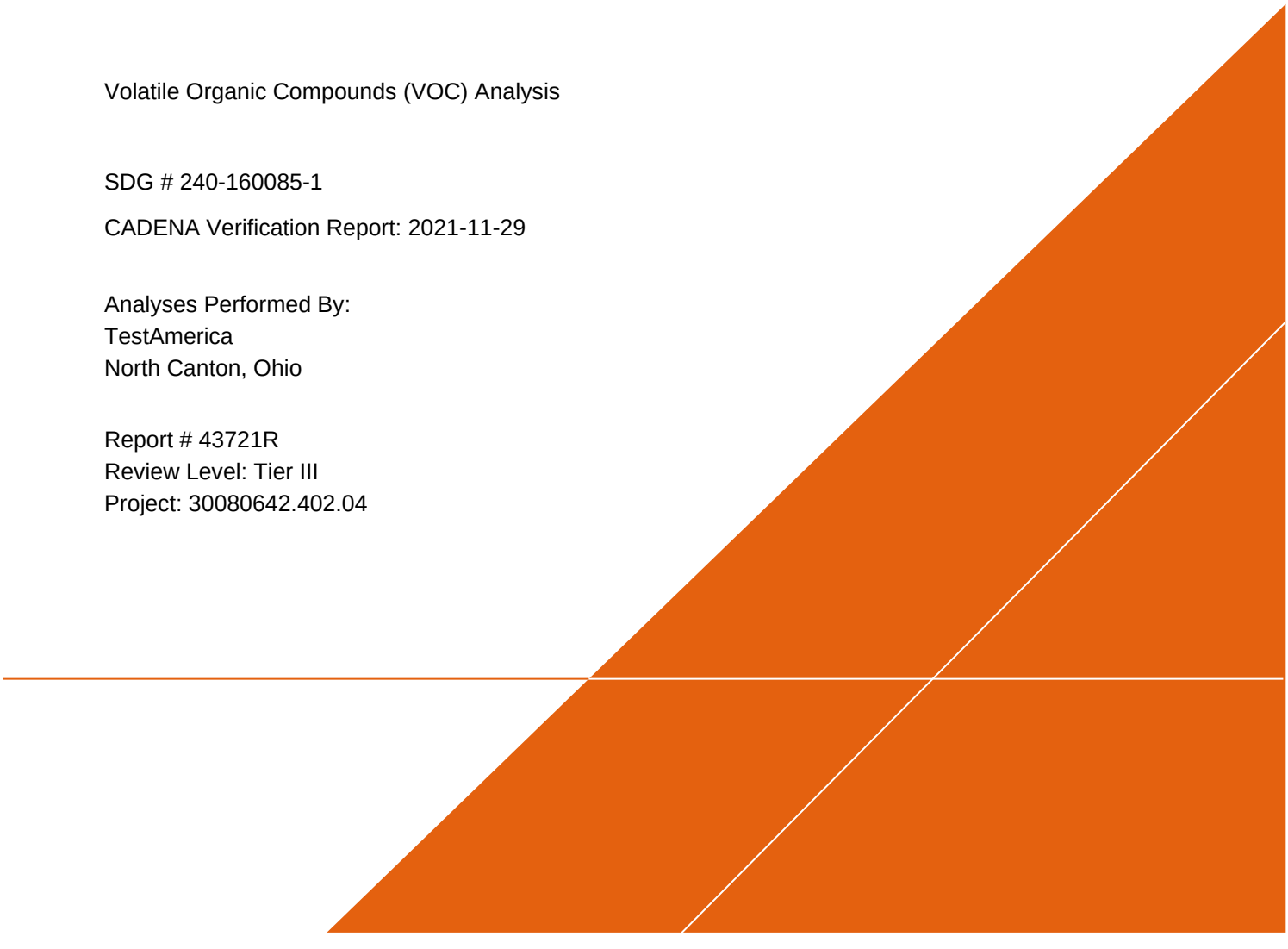
Volatile Organic Compounds (VOC) Analysis

SDG # 240-160085-1

CADENA Verification Report: 2021-11-29

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43721R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-160085-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_121	240-160085-1	Water	11/11/21		X	
MW-147S_111121	240-160085-2	Water	11/11/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

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Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	For lab use only
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	Walk-in client
Phone: 248-994-2240	Sampler Name: SOMMER GUY	TAT if different from below: 10 day; 3 weeks / 2 weeks / 1 week / 2 days / 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30080642.402.04	Shipping/Tracking No:			
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_121	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-147S-111121	11/11/21	12:25		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-160085 Chain of Custody

Possible Hazard Identification
Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Return to Client Disposal By Lab Archive For Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Sommer Guy	Arcadis	11/11/21 14:30	Novi Cold Storage	Arcadis	11/11/21 14:30
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	ARCADIS	11/12/21 1000		GTN	11/12/21 1000
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
	GTN	11/12/21 1000		GTN	11-13-21 08:00

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11/29/2021

Client Sample ID: TRIP BLANK_121
Lab Sample ID: 240-160085-1
Date Collected: 11/11/21 00:00
Matrix: Water
Date Received: 11/13/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/22/21 19:30	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/22/21 19:30	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/22/21 19:30	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/22/21 19:30	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/22/21 19:30	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/22/21 19:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*62 - 137*		*11/22/21 19:30*	*1*
4-Bromofluorobenzene (Surr)	*97*		*56 - 136*		*11/22/21 19:30*	*1*
Toluene-d8 (Surr)	*104*		*78 - 122*		*11/22/21 19:30*	*1*
Dibromofluoromethane (Surr)	*113*		*73 - 120*		*11/22/21 19:30*	*1*

Client Sample ID: MW-147S_111121
Lab Sample ID: 240-160085-2
Date Collected: 11/11/21 12:25
Matrix: Water
Date Received: 11/13/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 23:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*		*11/18/21 23:25*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/22/21 21:05	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/22/21 21:05	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/22/21 21:05	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/22/21 21:05	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/22/21 21:05	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/22/21 21:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/22/21 21:05*	*1*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*		*11/22/21 21:05*	*1*
Toluene-d8 (Surr)	*103*		*78 - 122*		*11/22/21 21:05*	*1*
Dibromofluoromethane (Surr)	*112*		*73 - 120*		*11/22/21 21:05*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159953-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/29/2021 8:29:07 AM

Michael DelMonico, Project Manager I
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Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159953-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159953-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159953-1

Comments
No additional comments.

Receipt
The samples were received on 11/12/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.6° C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) associated with batch 513962 recovered above the upper control limit for Vinyl Chloride. The samples associated with this CCV were non-detect for the affected analyte; therefore, the data have been reported. The associated sample is impacted: TRIP BLANK_113 (240-159953-1).

Method 8260B: The continuing calibration verification (CCV) associated with batch 513804 recovered above the upper control limit for Vinyl Chloride. The samples associated with this CCV were non-detect for the affected analyte; therefore, the data have been reported. The associated sample is impacted: MW-103S_111021 (240-159953-2).

Method 8260B: The laboratory control sample (LCS) for 513804 recovered outside control limits for Tetrachloroethene. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159953-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159953-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159953-1	TRIP BLANK_113	Water	11/10/21 00:00	11/12/21 08:00
240-159953-2	MW-103S_111021	Water	11/10/21 10:28	11/12/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159953-1

Client Sample ID: TRIP BLANK_113 — Lab Sample ID: 240-159953-1

No Detections.

Client Sample ID: MW-103S_111021 — Lab Sample ID: 240-159953-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159953-1

Client Sample ID: TRIP BLANK_113
Date Collected: 11/10/21 00:00
Date Received: 11/12/21 08:00

Lab Sample ID: 240-159953-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 19:36	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 19:36	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 19:36	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 19:36	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 19:36	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 19:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*62 - 137*		*11/20/21 19:36*	*1*
4-Bromofluorobenzene (Surr)	*74*		*56 - 136*		*11/20/21 19:36*	*1*
Toluene-d8 (Surr)	*112*		*78 - 122*		*11/20/21 19:36*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/20/21 19:36*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159953-1

Client Sample ID: MW-103S_111021

Date Collected: 11/10/21 10:28
Date Received: 11/12/21 08:00

Lab Sample ID: 240-159953-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 02:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*66 - 120*		*11/18/21 02:20*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 16:23	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 16:23	1
Tetrachloroethene	1.0	U *+	1.0	0.44	ug/L			11/19/21 16:23	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 16:23	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 16:23	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 16:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/19/21 16:23*	*1*
1,2-Dichloroethane-d4 (Surr)	*95*		*62 - 137*		*11/19/21 16:45*	*1*
4-Bromofluorobenzene (Surr)	*75*		*56 - 136*		*11/19/21 16:23*	*1*
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*11/19/21 16:45*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/19/21 16:23*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/19/21 16:45*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/19/21 16:23*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/19/21 16:45*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159953-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
Lab Sample ID	Client Sample ID	DCA (62-137)	BFB (56-136)	TOL (78-122)	DBFM (73-120)
240-159953-1	TRIP BLANK_113	108	74	112	100
240-159953-2	MW-103S_111021	95	73	108	94
240-159953-2	MW-103S_111021	99	75	108	94
240-159953-2 MS	MW-103S_111021	100	85	115	96
240-159953-2 MSD	MW-103S_111021	99	87	112	92
240-160095-B-1 MS	Matrix Spike	96	84	113	91
240-160095-B-1 MSD	Matrix Spike Duplicate	95	85	103	88
LCS 240-513804/4	Lab Control Sample	100	87	118	98
LCS 240-513962/4	Lab Control Sample	97	79	113	93
MB 240-513804/6	Method Blank	105	81	118	101
MB 240-513962/6	Method Blank	103	76	112	94

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	DCA (66-120)
240-159642-H-3 MS	Matrix Spike	87
240-159642-M-3 MSD	Matrix Spike Duplicate	87
240-159953-2	MW-103S_111021	86
LCS 240-513480/3	Lab Control Sample	84
MB 240-513480/4	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513804/6
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 15:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 15:38	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 15:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 15:38	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 15:38	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 15:38	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/19/21 15:38*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/19/21 15:38*	*1*
Toluene-d8 (Surr)	*118*		*78 - 122*		*11/19/21 15:38*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/19/21 15:38*	*1*

Lab Sample ID: LCS 240-513804/4
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	11.0		ug/L		110	63 - 134
cis-1,2-Dichloroethene	10.0	11.0		ug/L		110	77 - 123
Tetrachloroethene	10.0	13.0	*+	ug/L		130	76 - 123
trans-1,2-Dichloroethene	10.0	10.8		ug/L		108	75 - 124
Trichloroethene	10.0	9.54		ug/L		95	70 - 122
Vinyl chloride	10.0	11.1		ug/L		111	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*118*		*78 - 122*
Dibromofluoromethane (Surr)	*98*		*73 - 120*

Lab Sample ID: 240-159953-2 MS
Matrix: Water
Analysis Batch: 513804

Client Sample ID: MW-103S_111021
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	10.3		ug/L		103	66 - 128
Tetrachloroethene	1.0	U *+	10.0	10.2		ug/L		102	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	56 - 136
Trichloroethene	1.0	U	10.0	8.59		ug/L		86	61 - 124
Vinyl chloride	1.0	U	10.0	10.2		ug/L		102	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*
Toluene-d8 (Surr)	*115*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513804/6
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 15:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 15:38	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 15:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 15:38	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 15:38	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 15:38	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/19/21 15:38*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/19/21 15:38*	*1*
Toluene-d8 (Surr)	*118*		*78 - 122*		*11/19/21 15:38*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/19/21 15:38*	*1*

Lab Sample ID: LCS 240-513804/4
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	11.0		ug/L		110	63 - 134
cis-1,2-Dichloroethene	10.0	11.0		ug/L		110	77 - 123
Tetrachloroethene	10.0	13.0	*+	ug/L		130	76 - 123
trans-1,2-Dichloroethene	10.0	10.8		ug/L		108	75 - 124
Trichloroethene	10.0	9.54		ug/L		95	70 - 122
Vinyl chloride	10.0	11.1		ug/L		111	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*118*		*78 - 122*
Dibromofluoromethane (Surr)	*98*		*73 - 120*

Lab Sample ID: 240-159953-2 MS
Matrix: Water
Analysis Batch: 513804

Client Sample ID: MW-103S_111021
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	10.3		ug/L		103	66 - 128
Tetrachloroethene	1.0	U *+	10.0	10.2		ug/L		102	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	56 - 136
Trichloroethene	1.0	U	10.0	8.59		ug/L		86	61 - 124
Vinyl chloride	1.0	U	10.0	10.2		ug/L		102	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*
Toluene-d8 (Surr)	*115*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513804/6
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 15:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 15:38	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 15:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 15:38	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 15:38	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 15:38	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/19/21 15:38*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/19/21 15:38*	*1*
Toluene-d8 (Surr)	*118*		*78 - 122*		*11/19/21 15:38*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/19/21 15:38*	*1*

Lab Sample ID: LCS 240-513804/4
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	11.0		ug/L		110	63 - 134
cis-1,2-Dichloroethene	10.0	11.0		ug/L		110	77 - 123
Tetrachloroethene	10.0	13.0	*+	ug/L		130	76 - 123
trans-1,2-Dichloroethene	10.0	10.8		ug/L		108	75 - 124
Trichloroethene	10.0	9.54		ug/L		95	70 - 122
Vinyl chloride	10.0	11.1		ug/L		111	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*118*		*78 - 122*
Dibromofluoromethane (Surr)	*98*		*73 - 120*

Lab Sample ID: 240-159953-2 MS
Matrix: Water
Analysis Batch: 513804

Client Sample ID: MW-103S_111021
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	10.3		ug/L		103	66 - 128
Tetrachloroethene	1.0	U *+	10.0	10.2		ug/L		102	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	56 - 136
Trichloroethene	1.0	U	10.0	8.59		ug/L		86	61 - 124
Vinyl chloride	1.0	U	10.0	10.2		ug/L		102	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*
Toluene-d8 (Surr)	*115*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159953-2 MS
Matrix: Water
Analysis Batch: 513804

Client Sample ID: MW-103S_111021
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*96*		*73 - 120*

Lab Sample ID: 240-159953-2 MSD
Matrix: Water
Analysis Batch: 513804

Client Sample ID: MW-103S_111021
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.86		ug/L		99	56 - 135	5	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.79		ug/L		98	66 - 128	5	14
Tetrachloroethene	1.0	U *+	10.0	9.63		ug/L		96	62 - 131	6	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.82		ug/L		98	56 - 136	5	15
Trichloroethene	1.0	U	10.0	8.28		ug/L		83	61 - 124	4	15
Vinyl chloride	1.0	U	10.0	10.7		ug/L		107	43 - 157	5	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*112*		*78 - 122*
Dibromofluoromethane (Surr)	*92*		*73 - 120*

Lab Sample ID: MB 240-513962/6
Matrix: Water
Analysis Batch: 513962

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 15:30	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 15:30	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 15:30	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 15:30	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 15:30	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 15:30	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*		*11/20/21 15:30*	*1*
4-Bromofluorobenzene (Surr)	*76*		*56 - 136*		*11/20/21 15:30*	*1*
Toluene-d8 (Surr)	*112*		*78 - 122*		*11/20/21 15:30*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/20/21 15:30*	*1*

Lab Sample ID: LCS 240-513962/4
Matrix: Water
Analysis Batch: 513962

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,1-Dichloroethene			10.0	9.62		ug/L		96	63 - 134		
cis-1,2-Dichloroethene			10.0	10.4		ug/L		104	77 - 123		
Tetrachloroethene			10.0	10.5		ug/L		105	76 - 123		
trans-1,2-Dichloroethene			10.0	10.2		ug/L		102	75 - 124		
Trichloroethene			10.0	8.81		ug/L		88	70 - 122		

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-513962/4
Matrix: Water
Analysis Batch: 513962

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Vinyl chloride			10.0	10.0		ug/L		100	60 - 144		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*62 - 137*
4-Bromofluorobenzene (Surr)	*79*		*56 - 136*
Toluene-d8 (Surr)	*113*		*78 - 122*
Dibromofluoromethane (Surr)	*93*		*73 - 120*

Lab Sample ID: 240-160095-B-1 MS
Matrix: Water
Analysis Batch: 513962

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,1-Dichloroethene	50	U	500	457		ug/L		91	56 - 135		
cis-1,2-Dichloroethene	50	U	500	478		ug/L		96	66 - 128		
Tetrachloroethene	50	U	500	451		ug/L		90	62 - 131		
trans-1,2-Dichloroethene	50	U	500	477		ug/L		95	56 - 136		
Trichloroethene	50	U	500	396		ug/L		79	61 - 124		
Vinyl chloride	50	U	500	476		ug/L		95	43 - 157		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*
Toluene-d8 (Surr)	*113*		*78 - 122*
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Lab Sample ID: 240-160095-B-1 MSD
Matrix: Water
Analysis Batch: 513962

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	50	U	500	486		ug/L		97	56 - 135	6	26
cis-1,2-Dichloroethene	50	U	500	481		ug/L		96	66 - 128	1	14
Tetrachloroethene	50	U	500	459		ug/L		92	62 - 131	2	20
trans-1,2-Dichloroethene	50	U	500	487		ug/L		97	56 - 136	2	15
Trichloroethene	50	U	500	399		ug/L		80	61 - 124	1	15
Vinyl chloride	50	U	500	504		ug/L		101	43 - 157	6	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*95*		*62 - 137*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*
Toluene-d8 (Surr)	*103*		*78 - 122*
Dibromofluoromethane (Surr)	*88*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513480/4
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 19:58	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/17/21 19:58*	*1*

Lab Sample ID: LCS 240-513480/3
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	9.37		ug/L		94	80 - 122		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*

Lab Sample ID: 240-159642-H-3 MS
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U F1	10.0	10.3		ug/L		103	51 - 153		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

Lab Sample ID: 240-159642-M-3 MSD
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.57		ug/L		96	51 - 153	7	16

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159953-1

GC/MS VOA

Analysis Batch: 513480

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159953-2	MW-103S_111021	Total/NA	Water	8260B SIM	
MB 240-513480/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513480/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159642-H-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159642-M-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513804

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159953-2	MW-103S_111021	Total/NA	Water	8260B	
240-159953-2	MW-103S_111021	Total/NA	Water	8260B	
MB 240-513804/6	Method Blank	Total/NA	Water	8260B	
LCS 240-513804/4	Lab Control Sample	Total/NA	Water	8260B	
240-159953-2 MS	MW-103S_111021	Total/NA	Water	8260B	
240-159953-2 MSD	MW-103S_111021	Total/NA	Water	8260B	

Analysis Batch: 513962

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159953-1	TRIP BLANK_113	Total/NA	Water	8260B	
MB 240-513962/6	Method Blank	Total/NA	Water	8260B	
LCS 240-513962/4	Lab Control Sample	Total/NA	Water	8260B	
240-160095-B-1 MS	Matrix Spike	Total/NA	Water	8260B	
240-160095-B-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159953-1

Client Sample ID: TRIP BLANK_113

Lab Sample ID: 240-159953-1

Date Collected: 11/10/21 00:00

Matrix: Water

Date Received: 11/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513962	11/20/21 19:36	LEE	TAL CAN

Client Sample ID: MW-103S_111021

Lab Sample ID: 240-159953-2

Date Collected: 11/10/21 10:28

Matrix: Water

Date Received: 11/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513804	11/19/21 16:23	LEE	TAL CAN
Total/NA	Analysis	8260B		1	513804	11/19/21 16:45	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513480	11/18/21 02:20	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159953-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton -- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

Client Contact	Client Project Manager: Kyle Brooks	Site Contact: John McClatchey	Lab Contact: Mike Guilmette	TestAmerica Laboratories, Inc.
Company Name: Arcadis	Telephone: [redacted]	Telephone: 734-464-5161	Telephone: 734-947-9306	COC No:
Address: 48550 Cabot Drive, Suite 300	Email: kristoffer.brooks@arcadis.com	Analysis Turnaround Time		
City/State/Zip: Novi, MI, 48377	Sampler Name: [redacted]	TAT (Business days)		For lab use only
Phone: 248-994-2240	Method of Shipment/Carrier	90 day / 7 week / 1 week / 2 day / 1 day		Walk-in client:
Project Name: Ford LTV Offsite	Shipping/Tracking No:			Lab sampling:
Project Number: [redacted]				Job/SDG No:
PO # [redacted]				

Sample Identification	Sample Date	Sample Time	Matrix: Air / Aqueous / Sediment / Solid / Other	Containers & Preservatives: HCL / HNO3 / H2SO4 / NaOH / NaHSO4 / NaOH,ZnAc / Other	Filtered Sample (Y / N)	Composited / Grabbed	Analysis: 1,1-DCE 8260B / cis-1,2-DCE 8260B / Trans-1,2-DCE 8260B / PCE 8260B / TCE 8260B / Vinyl Chloride 8260B / 1,4-Dioxane 8260B SIM	Sample Bundle Note / Special Instructions
TRIP BLANK 113	—	—	X	1	N	G	X X X X X X X	1 Trip Blank
MW-1035-111021	11/10/21	10:50	X	6	N	G	X X X X X X X	3 VOAs for 8260B 3 VOAs for 8260B SIM

340-159953 Chain of Custody

Possible Hazard Identification: Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / Disposal By Lab / Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
[redacted]	Arcadis	11/10/21 1600	[redacted]	[redacted]	11/10/21 1600
[redacted]	Arcadis	11/11/21 0950	[redacted]	[redacted]	11/11/21 0950
[redacted]	EA	11-11-21 1046	[redacted]	EA	11/11/21 1046

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 59953**
Canton Facility

Client Arcadis Site Name

Cooler unpacked by: Matthew Surma

Cooler Received on 11/12/21 Opened on 11/12/21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours. Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.5 °C Corrected Cooler Temp. 0.6 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2 Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5 Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	~~No~~ M.P.S.
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9 For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No (NA)	pH Strip Lot# HC157842
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this	Yes (No)	NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present?	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by.

No SIM on TB per Corrected COC. Date 11/12/21

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired

Sample(s) were received in a broken container

Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.

Time preserved Preservative(s) added/Lot number(s)

VOA Sample Preservation - Date/Time VOAs Frozen:

DATA VERIFICATION REPORT

November 29, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159953-1
Sample date: 2021-11-10
Report received by CADENA: 2021-11-29
Initial Data Verification completed by CADENA: 2021-11-29
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 513804 LCS recovery was outlying biased high for the following analyte: TETRACHLOROETHENE. Associated client sample results were non-detect so qualification was not required based on this high bias QC outlier.

GCMS VOC QC batch CCV response outliers as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, MS/MSD Recovery, MS/MSD RPD, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159953-1

		Sample Name:	TRIP BLANK_113				MW-103S_111021			
		Lab Sample ID:	2401599531				2401599532			
		Sample Date:	11/10/2021				11/10/2021			
Analyte		Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC										
	OSW-8260B									
	1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	OSW-8260BBSim									
	1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

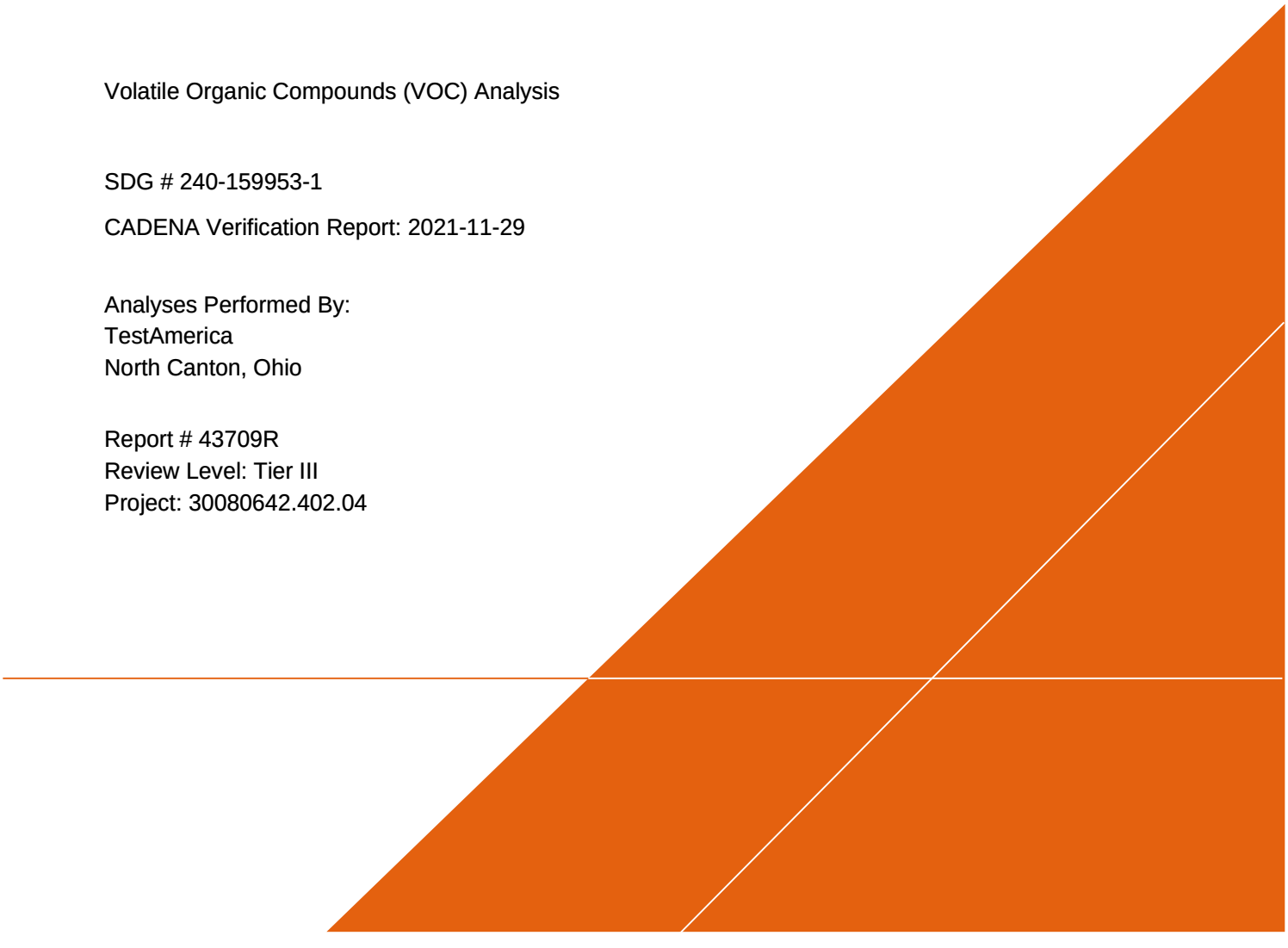
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159953-1

CADENA Verification Report: 2021-11-29

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43709R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159953-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_113	240-159953-1	Water	11/10/21		X	
MW-103S_111021	240-159953-2	Water	11/10/21		X	X

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Lab file ID	Compound	Criteria
TRIP BLANK_113	Continuous Calibration Verification %D	UXJ2427.D	Vinyl chloride	+22.0%
MW-103S_111021		UXJ2365.D	Vinyl chloride	+30.0%
			cis-1,2-Dichloroethene	+20.5%
			Tetrachloroethene	+21.1%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J

Initial/Continuing	Criteria	Sample Result	Qualification
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 14, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 14, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW — NPDES — RCRA — Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Sommer Guy	TAT if different from below		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:	10 day ✓ 2 weeks / 3 weeks / 1 week / 2 days / 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 113	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1035-111021	11/10/21	10 28		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159953 Chain of Custody

Possible Hazard Identification
✓ Non-Hazard — Flammable — an Irritant — Poison B — Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Return to Client — ✓ Disposal By Lab — Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com Cadena #E203631
Level IV Reporting requested

Relinquished by: Sommer Guy	Company: Arcadis	Date/Time: 11/10/21 16 00	Received by: Novi cold Storage	Company: Arcadis	Date/Time: 11/10/21 16 00
Relinquished by: [signature]	Company: ARCADIS	Date/Time: 11/11/21 0950	Received by: [signature]	Company: ETA	Date/Time: 11/11/21 0950
Relinquished by: [signature]	Company: ETA	Date/Time: 11-11-21 1046	Received in Laboratory by: [signature]	Company: ETA	Date/Time: 11/12/21 8:00

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11/29/2021

Client Sample ID: TRIP BLANK_113 — Lab Sample ID: 240-159953-1

Date Collected: 11/10/21 00:00 **Matrix: Water**
Date Received: 11/12/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 19:36	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 19:36	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 19:36	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 19:36	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 19:36	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 19:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*62 - 137*		*11/20/21 19:36*	
4-Bromofluorobenzene (Surr)	*74*		*56 - 136*		*11/20/21 19:36*	
Toluene-d8 (Surr)	*112*		*78 - 122*		*11/20/21 19:36*	
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/20/21 19:36*	

Client Sample ID: MW-103S_111021 — Lab Sample ID: 240-159953-2

Date Collected: 11/10/21 10:28 **Matrix: Water**
Date Received: 11/12/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 02:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*66 - 120*		*11/18/21 02:20*	

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 16:23	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 16:23	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 16:23	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 16:23	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 16:23	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 16:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/19/21 16:23*	
1,2-Dichloroethane-d4 (Surr)	*95*		*62 - 137*		*11/19/21 16:45*	
4-Bromofluorobenzene (Surr)	*75*		*56 - 136*		*11/19/21 16:23*	
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*11/19/21 16:45*	
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/19/21 16:23*	
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/19/21 16:45*	
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/19/21 16:23*	
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/19/21 16:45*	

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159616-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/22/2021 3:33:32 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159616-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159616-1

Job ID: 240-159616-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159616-1

Comments
No additional comments.

Receipt
The samples were received on 11/9/2021 10:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 3.7º C and 3.8º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159616-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159616-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159616-1	TRIP BLANK_59	Water	11/05/21 00:00	11/09/21 10:00
240-159616-2	MW-127S_110521	Water	11/05/21 11:32	11/09/21 10:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159616-1

Client Sample ID: TRIP BLANK_59 — Lab Sample ID: 240-159616-1

No Detections.

Client Sample ID: MW-127S_110521 — Lab Sample ID: 240-159616-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	2.3		1.0	0.45	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159616-1

Client Sample ID: TRIP BLANK_59
Date Collected: 11/05/21 00:00
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159616-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 15:17	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 15:17	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 15:17	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 15:17	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 15:17	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 15:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*62 - 137*		*11/16/21 15:17*	*1*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*		*11/16/21 15:17*	*1*
Toluene-d8 (Surr)	*96*		*78 - 122*		*11/16/21 15:17*	*1*
Dibromofluoromethane (Surr)	*108*		*73 - 120*		*11/16/21 15:17*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159616-1

Client Sample ID: MW-127S_110521
Date Collected: 11/05/21 11:32
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159616-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/13/21 02:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*		*11/13/21 02:26*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 18:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 18:50	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 18:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 18:50	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 18:50	1
Vinyl chloride	**2.3**		1.0	0.45	ug/L			11/16/21 18:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/16/21 18:50*	*1*
4-Bromofluorobenzene (Surr)	*92*		*56 - 136*		*11/16/21 18:50*	*1*
Toluene-d8 (Surr)	*99*		*78 - 122*		*11/16/21 18:50*	*1*
Dibromofluoromethane (Surr)	*118*		*73 - 120*		*11/16/21 18:50*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159616-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159616-1	TRIP BLANK_59	95	87	96	108
240-159616-2	MW-127S_110521	105	92	99	118
240-159636-F-2 MS	Matrix Spike	93	93	102	105
240-159636-G-2 MSD	Matrix Spike Duplicate	93	94	103	105
LCS 240-513208/5	Lab Control Sample	86	91	100	101
MB 240-513208/8	Method Blank	91	87	98	108

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159543-G-3 MS	Matrix Spike	85
240-159543-O-3 MSD	Matrix Spike Duplicate	83
240-159616-2	MW-127S_110521	81
LCS 240-512758/4	Lab Control Sample	83
MB 240-512758/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513208/8
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 14:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 14:06	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 14:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 14:06	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 14:06	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 14:06	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*62 - 137*		*11/16/21 14:06*	*1*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*		*11/16/21 14:06*	*1*
Toluene-d8 (Surr)	*98*		*78 - 122*		*11/16/21 14:06*	*1*
Dibromofluoromethane (Surr)	*108*		*73 - 120*		*11/16/21 14:06*	*1*

Lab Sample ID: LCS 240-513208/5
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	28.3		ug/L		113	63 - 134
cis-1,2-Dichloroethene	25.0	26.1		ug/L		104	77 - 123
Tetrachloroethene	25.0	29.3		ug/L		117	76 - 123
trans-1,2-Dichloroethene	25.0	27.4		ug/L		110	75 - 124
Trichloroethene	25.0	27.4		ug/L		110	70 - 122
Vinyl chloride	25.0	24.0		ug/L		96	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*
4-Bromofluorobenzene (Surr)	*91*		*56 - 136*
Toluene-d8 (Surr)	*100*		*78 - 122*
Dibromofluoromethane (Surr)	*101*		*73 - 120*

Lab Sample ID: 240-159636-F-2 MS
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	25.0	25.8		ug/L		103	56 - 135
cis-1,2-Dichloroethene	1.0	U	25.0	24.8		ug/L		99	66 - 128
Tetrachloroethene	1.0	U	25.0	28.9		ug/L		116	62 - 131
trans-1,2-Dichloroethene	1.0	U	25.0	25.3		ug/L		101	56 - 136
Trichloroethene	1.0	U	25.0	25.4		ug/L		101	61 - 124
Vinyl chloride	1.0	U	25.0	22.2		ug/L		89	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*93*		*56 - 136*
Toluene-d8 (Surr)	*102*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159636-F-2 MS
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	105		73 - 120

Lab Sample ID: 240-159636-G-2 MSD
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	25.0	25.9		ug/L		104	56 - 135	0	26
cis-1,2-Dichloroethene	1.0	U	25.0	25.0		ug/L		100	66 - 128	1	14
Tetrachloroethene	1.0	U	25.0	29.5		ug/L		118	62 - 131	2	20
trans-1,2-Dichloroethene	1.0	U	25.0	25.1		ug/L		100	56 - 136	1	15
Trichloroethene	1.0	U	25.0	25.3		ug/L		101	61 - 124	0	15
Vinyl chloride	1.0	U	25.0	22.3		ug/L		89	43 - 157	1	24

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	93		62 - 137
4-Bromofluorobenzene (Surr)	94		56 - 136
Toluene-d8 (Surr)	103		78 - 122
Dibromofluoromethane (Surr)	105		73 - 120

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512758/5
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 16:51	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	84		66 - 120		11/12/21 16:51	1

Lab Sample ID: LCS 240-512758/4
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.63		ug/L		96	80 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	83		66 - 120

Lab Sample ID: 240-159543-G-3 MS
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	9.98		ug/L		100	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

Lab Sample ID: 240-159543-O-3 MSD
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.71		ug/L		97	51 - 153	3	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159616-1

GC/MS VOA

Analysis Batch: 512758

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159616-2	MW-127S_110521	Total/NA	Water	8260B SIM	
MB 240-512758/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512758/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159543-G-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159543-O-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513208

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159616-1	TRIP BLANK_59	Total/NA	Water	8260B	
240-159616-2	MW-127S_110521	Total/NA	Water	8260B	
MB 240-513208/8	Method Blank	Total/NA	Water	8260B	
LCS 240-513208/5	Lab Control Sample	Total/NA	Water	8260B	
240-159636-F-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159636-G-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159616-1

Client Sample ID: TRIP BLANK_59

Lab Sample ID: 240-159616-1

Date Collected: 11/05/21 00:00

Matrix: Water

Date Received: 11/09/21 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513208	11/16/21 15:17	SAM	TAL CAN

Client Sample ID: MW-127S_110521

Lab Sample ID: 240-159616-2

Date Collected: 11/05/21 11:32

Matrix: Water

Date Received: 11/09/21 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513208	11/16/21 18:50	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	512758	11/13/21 02:26	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159616-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

MICHIGAN 190

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	
Phone: 248-994-2240	Sampler Name: Sommer Guy	TAT if different from below: ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day	
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:	10 day	
Project Number: 30080642.402.04	Shipping/Tracking No:		
PO # 30080642.402.04			

COC No: 1 of 1 COCs

For lab use only: Walk-in client; Lab sampling; Job/SDG No:

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_59	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-127S_110521	11/5/21	11:32		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159616 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalla@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by: Sommer Guy	Company: Arcadis	Date/Time: 11/5/21 13:00	Received by: Novi Cold storage	Company: Arcadis	Date/Time: 11/5/21 13:00
Relinquished by:	Company: ARCADIS	Date/Time: 11/8/21 1200	Received by:	Company: ETA	Date/Time: 11/8/21 1200
Relinquished by:	Company: ETA	Date/Time:	Received in Laboratory by:	Company: ETA	Date/Time: 11-9-21 1000

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11/22/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159616**
Canton Facility

Client ARCADIS Site Name _____ Cooler unpacked by: Tammy Dorn

Cooler Received on 11-9-21 Opened on 11-9-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # _____ Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 2	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?	Yes	No
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC157842
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 60358	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

SMF 11/9/21 yes yes JMC 11/11/21

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

TB is not logged for STM ~~due to insufficient volume.~~ per corrected COC. SMF 11/11/21 SMF 11/9/21

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

Login # : 159616

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form				
Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
(TA) Client Box Other	(IR-14) IR-15	3.6	3.7	(Wet Ice) Blue Ice Dry Ice Water None
(TA) Client Box Other	(IR-14) IR-15	3.7	3.8	(Wet Ice) Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice

DATA VERIFICATION REPORT

November 22, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159616-1
Sample date: 2021-11-05
Report received by CADENA: 2021-11-22
Initial Data Verification completed by CADENA: 2021-11-22
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159616-1

		Sample Name:	TRIP BLANK_59				MW-127S_110521			
		Lab Sample ID:	2401596161				2401596162			
		Sample Date:	11/5/2021				11/5/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	2.3	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

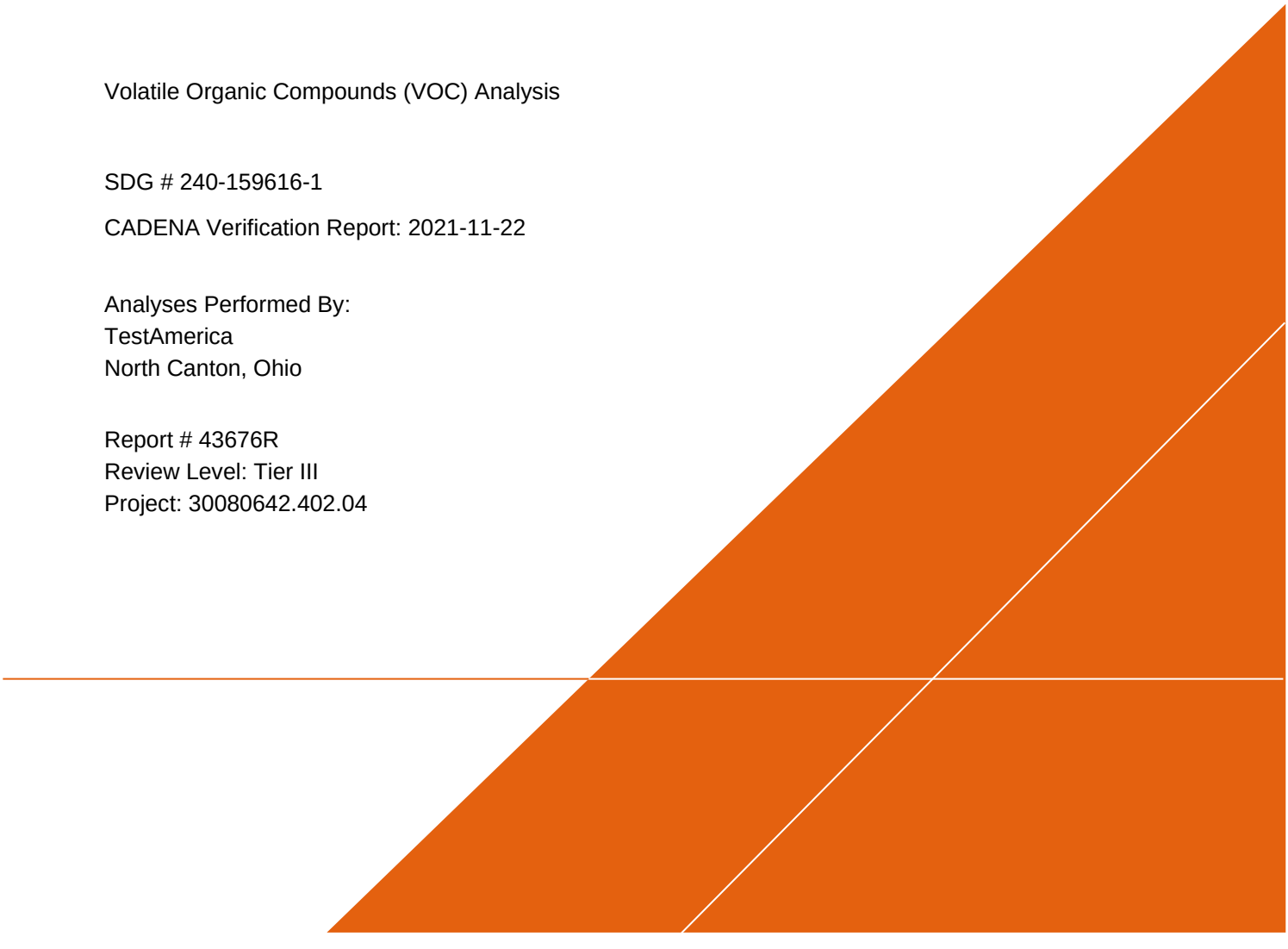
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159616-1

CADENA Verification Report: 2021-11-22

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43676R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159616-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_59	240-159616-1	Water	11/05/21		X	
MW-127S_110521	240-159616-2	Water	11/05/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 10, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 14, 2021

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190

TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Sommer Guy	TAT if different from below: 10 day; ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn/Ac/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 59	---	---		X						1					N	G	X	X	X	X	X	X	X*	1 Trip Blank
MW-127S_110521	11/5/21	11:32		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159616 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Sommer Guy	Arcadis	11/5/21 13:00	Novi Cold Storage	Arcadis	11/5/21 13:00
[signature]	ARCADIS	11/8/21 1200	[signature]	ETA	11/8/21 1200
[signature]	ETA		Received in Laboratory by: [signature]	ETA	11-9-21 1000

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Client Sample ID: TRIP BLANK_59
Lab Sample ID: 240-159616-1
Date Collected: 11/05/21 00:00
Matrix: Water
Date Received: 11/09/21 10:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 15:17	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 15:17	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 15:17	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 15:17	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 15:17	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 15:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*62 - 137*		*11/16/21 15:17*	*1*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*		*11/16/21 15:17*	*1*
Toluene-d8 (Surr)	*96*		*78 - 122*		*11/16/21 15:17*	*1*
Dibromofluoromethane (Surr)	*108*		*73 - 120*		*11/16/21 15:17*	*1*

Client Sample ID: MW-127S_110521
Lab Sample ID: 240-159616-2
Date Collected: 11/05/21 11:32
Matrix: Water
Date Received: 11/09/21 10:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/13/21 02:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*		*11/13/21 02:26*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 18:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 18:50	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 18:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 18:50	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 18:50	1
Vinyl chloride	**2.3**		1.0	0.45	ug/L			11/16/21 18:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/16/21 18:50*	*1*
4-Bromofluorobenzene (Surr)	*92*		*56 - 136*		*11/16/21 18:50*	*1*
Toluene-d8 (Surr)	*99*		*78 - 122*		*11/16/21 18:50*	*1*
Dibromofluoromethane (Surr)	*118*		*73 - 120*		*11/16/21 18:50*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159954-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/29/2021 8:29:56 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159954-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159954-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159954-1

Comments
No additional comments.

Receipt
The samples were received on 11/12/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.6° C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) associated with batch 513804 recovered above the upper control limit for Vinyl Chloride. The samples associated with this CCV were non-detect for the affected analyte; therefore, the data have been reported. The associated samples are impacted: TRIP BLANK_114 (240-159954-1) and MW-169S_111021 (240-159954-2).

Method 8260B: The laboratory control sample (LCS) for 513804 recovered outside control limits for Tetrachloroethene. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159954-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159954-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159954-1	TRIP BLANK_114	Water	11/10/21 00:00	11/12/21 08:00
240-159954-2	MW-169S_111021	Water	11/10/21 11:45	11/12/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159954-1

Client Sample ID: TRIP BLANK_114 — Lab Sample ID: 240-159954-1

No Detections.

Client Sample ID: MW-169S_111021 — Lab Sample ID: 240-159954-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159954-1

Client Sample ID: TRIP BLANK_114
Date Collected: 11/10/21 00:00
Date Received: 11/12/21 08:00

Lab Sample ID: 240-159954-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 17:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 17:07	1
Tetrachloroethene	1.0	U *+	1.0	0.44	ug/L			11/19/21 17:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 17:07	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 17:07	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 17:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*		*11/19/21 17:07*	*1*
4-Bromofluorobenzene (Surr)	*75*		*56 - 136*		*11/19/21 17:07*	*1*
Toluene-d8 (Surr)	*115*		*78 - 122*		*11/19/21 17:07*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/19/21 17:07*	*1*

Client Sample ID: MW-169S_111021

Date Collected: 11/10/21 11:45
Date Received: 11/12/21 08:00

Lab Sample ID: 240-159954-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 02:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*66 - 120*		*11/18/21 02:44*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 17:30	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 17:30	1
Tetrachloroethene	1.0	U *+	1.0	0.44	ug/L			11/19/21 17:30	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 17:30	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 17:30	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 17:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*62 - 137*		*11/19/21 17:30*	*1*
4-Bromofluorobenzene (Surr)	*77*		*56 - 136*		*11/19/21 17:30*	*1*
Toluene-d8 (Surr)	*112*		*78 - 122*		*11/19/21 17:30*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/19/21 17:30*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159954-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
Lab Sample ID	Client Sample ID	DCA (62-137)	BFB (56-136)	TOL (78-122)	DBFM (73-120)
240-159953-A-2 MS	Matrix Spike	100	85	115	96
240-159953-D-2 MSD	Matrix Spike Duplicate	99	87	112	92
240-159954-1	TRIP BLANK_114	103	75	115	99
240-159954-2	MW-169S_111021	101	77	112	96
LCS 240-513804/4	Lab Control Sample	100	87	118	98
MB 240-513804/6	Method Blank	105	81	118	101

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	DCA (66-120)
240-159642-H-3 MS	Matrix Spike	87
240-159642-M-3 MSD	Matrix Spike Duplicate	87
240-159954-2	MW-169S_111021	86
LCS 240-513480/3	Lab Control Sample	84
MB 240-513480/4	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513804/6
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 15:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 15:38	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 15:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 15:38	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 15:38	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 15:38	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/19/21 15:38*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/19/21 15:38*	*1*
Toluene-d8 (Surr)	*118*		*78 - 122*		*11/19/21 15:38*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/19/21 15:38*	*1*

Lab Sample ID: LCS 240-513804/4
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	11.0		ug/L		110	63 - 134
cis-1,2-Dichloroethene	10.0	11.0		ug/L		110	77 - 123
Tetrachloroethene	10.0	13.0	*+	ug/L		130	76 - 123
trans-1,2-Dichloroethene	10.0	10.8		ug/L		108	75 - 124
Trichloroethene	10.0	9.54		ug/L		95	70 - 122
Vinyl chloride	10.0	11.1		ug/L		111	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*118*		*78 - 122*
Dibromofluoromethane (Surr)	*98*		*73 - 120*

Lab Sample ID: 240-159953-A-2 MS
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	10.3		ug/L		103	66 - 128
Tetrachloroethene	1.0	U *+	10.0	10.2		ug/L		102	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	56 - 136
Trichloroethene	1.0	U	10.0	8.59		ug/L		86	61 - 124
Vinyl chloride	1.0	U	10.0	10.2		ug/L		102	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*
Toluene-d8 (Surr)	*115*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159953-A-2 MS
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*96*		*73 - 120*

Lab Sample ID: 240-159953-D-2 MSD
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.86		ug/L		99	56 - 135	5	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.79		ug/L		98	66 - 128	5	14
Tetrachloroethene	1.0	U *+	10.0	9.63		ug/L		96	62 - 131	6	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.82		ug/L		98	56 - 136	5	15
Trichloroethene	1.0	U	10.0	8.28		ug/L		83	61 - 124	4	15
Vinyl chloride	1.0	U	10.0	10.7		ug/L		107	43 - 157	5	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*112*		*78 - 122*
Dibromofluoromethane (Surr)	*92*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513480/4
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 19:58	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/17/21 19:58*	*1*

Lab Sample ID: LCS 240-513480/3
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.37		ug/L		94	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*

Lab Sample ID: 240-159642-H-3 MS
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.3		ug/L		103	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

Lab Sample ID: 240-159642-M-3 MSD
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.57		ug/L		96	51 - 153	7	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

GC/MS VOA

Analysis Batch: 513480

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159954-2	MW-169S_111021	Total/NA	Water	8260B SIM	
MB 240-513480/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513480/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159642-H-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159642-M-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513804

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159954-1	TRIP BLANK_114	Total/NA	Water	8260B	
240-159954-2	MW-169S_111021	Total/NA	Water	8260B	
MB 240-513804/6	Method Blank	Total/NA	Water	8260B	
LCS 240-513804/4	Lab Control Sample	Total/NA	Water	8260B	
240-159953-A-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159953-D-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159954-1

Client Sample ID: TRIP BLANK_114

Lab Sample ID: 240-159954-1

Date Collected: 11/10/21 00:00

Matrix: Water

Date Received: 11/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513804	11/19/21 17:07	LEE	TAL CAN

Client Sample ID: MW-169S_111021

Lab Sample ID: 240-159954-2

Date Collected: 11/10/21 11:45

Matrix: Water

Date Received: 11/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513804	11/19/21 17:30	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513480	11/18/21 02:44	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159954-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN
DW

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2769

Regulatory program: DW NPDES RCRA Other

Client Contact	Client Project Manager: Kris Hinsley	Site Contact: Julie McClatchey	Lab Contact: Kate Dettmann	TestAmerica Laboratories, Inc.
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-2131	Telephone: 810-227-5336	COC No:
Address: 28580 Cabot Drive, Suite 500	Email: kristoffer.hinsley@arcadis.com	Analysis Turnaround Time:		1 of 1 COC
City/State/Zip: Novi, MI, 48377	Sampler Name: Sommer Gould	TAT (Business days): 10 day		For lab use only:
Phone: 248-994-2240	Method of Shipment/Carrier:			Walk-in client:
Project Name: Ford LTP Off-Site	Shipper/Tracking No:			Lab sampling:
Project Number: 30030443.402.04				Job/SDG No:
PO #: 30030443.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Container & Preservatives: HCl/04	H2SO4	HNO3	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 624.1	1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_1114	—	—	X							1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1615_1021	11/10/21	11:45	X							3					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-59954 Chain of Custody

Possible Hazard Identification: Non-Hazard — Flammable — Skin Irritant — Poison B — Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client — Disposal By Lab — Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Central Regional Laboratory (CRL) — Address: 8100 [illegible]

Level IV Reporting required

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Sommer Gould	Arcadis	11/10/21 1100	Non-Cold Storage	Arcadis	11/10/21 1100
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[illegible]	Arcadis	11/10/21 1252	[illegible]	ETA	11/10/21 1252
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
[illegible]	ETA	11-11-21 1054	[illegible]	ETA	11/11/21 1054

11/29/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159454**
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Matthew Surna

Cooler Received on 11/12/21 Opened on 11/12/21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.5 °C Corrected Cooler Temp. 0.6 °C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2 Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes) No	
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes) No	NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes (No)	
-Were tamper/custody seals intact and uncompromised?	(Yes) No	NA
3 Shippers' packing slip attached to the cooler(s)?	Yes (No)	
4. Did custody papers accompany the sample(s)?	(Yes) No	
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes) No	
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes) No	M.J.
7. Did all bottles arrive in good condition (Unbroken)?	(Yes) No	
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes) No	
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes) No	
11. Sufficient quantity received to perform indicated analyses?	(Yes) No	
12. Are these work share samples and all listed on the COC?	Yes (No)	
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No (NA)	pH Strip Lot# **HC157842**
14 Were VOAs on the COC?	(Yes) No	
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this	Yes (No)	NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____	(Yes) No	
17. Was a LL Hg or Me Hg trip blank present? _____	Yes (No)	

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

No SIM on TB per Corrected COC. DMR 11/12/21

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen. _____

DATA VERIFICATION REPORT

November 29, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159954-1
Sample date: 2021-11-10
Report received by CADENA: 2021-11-29
Initial Data Verification completed by CADENA: 2021-11-29
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 513804 LCS recovery was outlying biased high for the following analyte: TETRACHLOROETHENE. Associated client sample results were non-detect so qualification was not required based on this high bias QC outlier.

GCMS VOC QC batch CCV response outliers as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159954-1

		Sample Name:	TRIP BLANK_114				MW-169S_111021			
		Lab Sample ID:	2401599541				2401599542			
		Sample Date:	11/10/2021				11/10/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

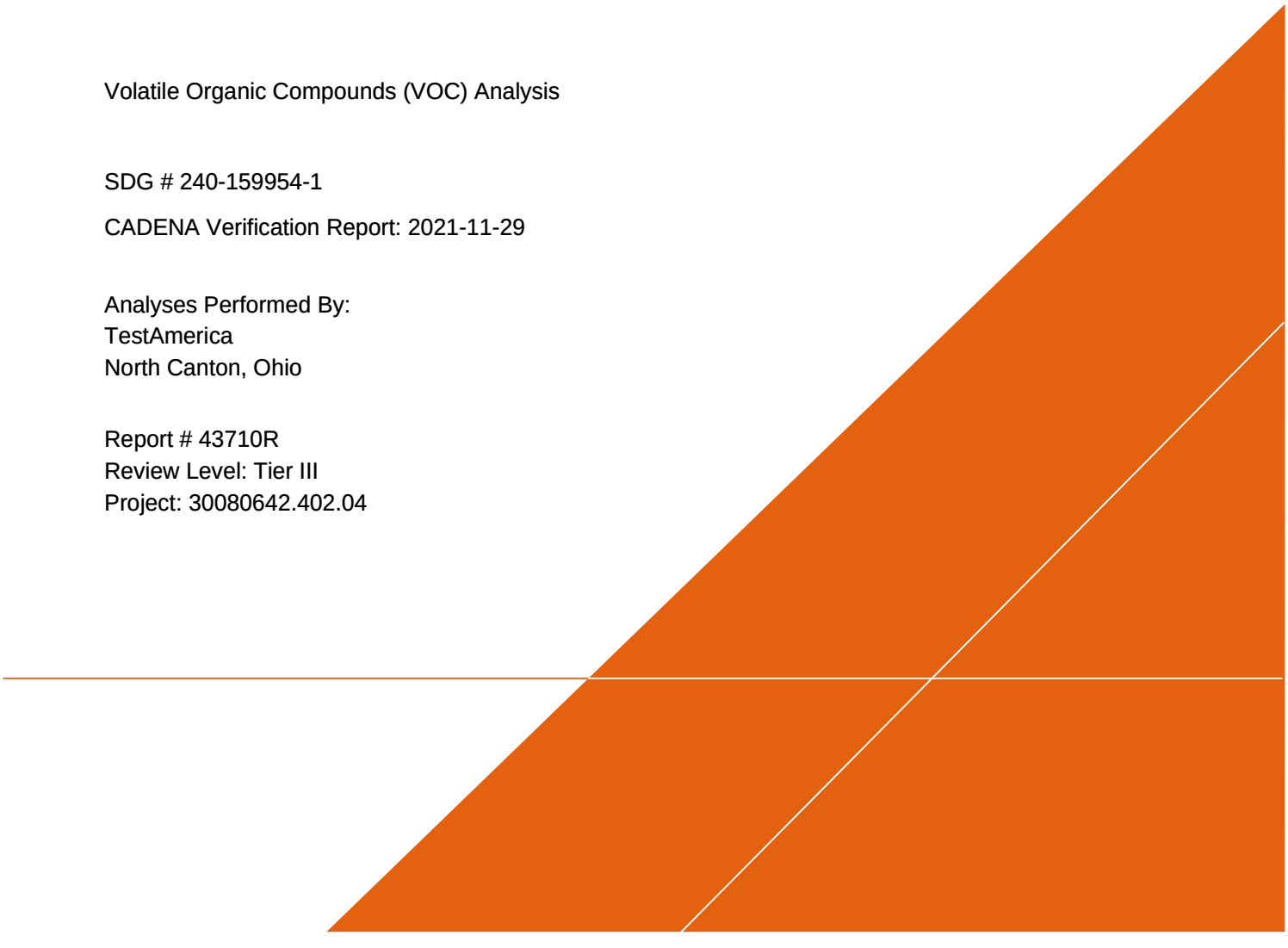
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159954-1

CADENA Verification Report: 2021-11-29

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43710R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159954-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_114	240-159954-1	Water	11/10/21		X	
MW-169S_111021	240-159954-2	Water	11/10/21		X	X

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Compound	Criteria
TRIP BLANK_114 MW-169S_111021	Continuous Calibration Verification %D	Vinyl chloride	+30.0%
		cis-1,2-Dichloroethene	+20.5%
		Tetrachloroethene	+21.1%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J

Initial/Continuing	Criteria	Sample Result	Qualification
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 14, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 14, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Sommer Guy	TAT if different from below: 10 day ☑ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client:
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 1114	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1695_111021	11/10/21	11:45		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159954 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal ByLab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Sommer Guy	Arcadis	11/10/21 16:00	Novi Cold Storage	Arcadis	11/10/21 16:00
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	ARCADIS	11/11/21/0950	[signature]	ETA	11/11/21 0950
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
[signature]	ETA	11-11-21 1046	M.S.	ETA	11/12/21 8:00

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Client Sample ID: TRIP BLANK_114
Lab Sample ID: 240-159954-1
Date Collected: 11/10/21 00:00
Matrix: Water
Date Received: 11/12/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 17:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 17:07	1
Tetrachloroethene	1.0	U *+	1.0	0.44	ug/L			11/19/21 17:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 17:07	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 17:07	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 17:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*		*11/19/21 17:07*	
4-Bromofluorobenzene (Surr)	*75*		*56 - 136*		*11/19/21 17:07*	
Toluene-d8 (Surr)	*115*		*78 - 122*		*11/19/21 17:07*	
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/19/21 17:07*	

Client Sample ID: MW-169S_111021
Lab Sample ID: 240-159954-2
Date Collected: 11/10/21 11:45
Matrix: Water
Date Received: 11/12/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 02:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*66 - 120*		*11/18/21 02:44*	

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 17:30	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 17:30	1
Tetrachloroethene	1.0	U *+	1.0	0.44	ug/L			11/19/21 17:30	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 17:30	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 17:30	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 17:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*62 - 137*		*11/19/21 17:30*	
4-Bromofluorobenzene (Surr)	*77*		*56 - 136*		*11/19/21 17:30*	
Toluene-d8 (Surr)	*112*		*78 - 122*		*11/19/21 17:30*	
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/19/21 17:30*	

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159710-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/24/2021 8:20:49 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159710-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159710-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159710-1

Comments
No additional comments.

Receipt
The samples were received on 11/10/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 0.7º C and 0.8º C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) for analytical batch 513594exceeded control criteria for Vinyl Chloride. The samples associated with this CCV were non-detect for the affected analyte. In accordance with the laboratory SOP, a low level CCV at the reporting limit (labeled as an MRL) was analyzed and the affected compounds were detected; therefore the data has been reported. No further corrective action was required: TRIP BLANK_80 (240-159710-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159710-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159710-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159710-1	TRIP BLANK_80	Water	11/08/21 00:00	11/10/21 08:00
240-159710-2	MW-149S_110821	Water	11/08/21 11:02	11/10/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159710-1

Client Sample ID: TRIP BLANK_80 — Lab Sample ID: 240-159710-1

No Detections.

Client Sample ID: MW-149S_110821 — Lab Sample ID: 240-159710-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	1.5		1.0	0.45	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159710-1

Client Sample ID: TRIP BLANK_80

Date Collected: 11/08/21 00:00
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159710-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 14:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 14:06	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 14:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 14:06	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 14:06	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 14:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*62 - 137*		*11/18/21 14:06*	*1*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*		*11/18/21 14:06*	*1*
Toluene-d8 (Surr)	*111*		*78 - 122*		*11/18/21 14:06*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/18/21 14:06*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159710-1

Client Sample ID: MW-149S_110821
Date Collected: 11/08/21 11:02
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159710-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 00:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*		*11/18/21 00:43*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 13:43	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 13:43	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 13:43	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 13:43	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 13:43	1
Vinyl chloride	**1.5**		1.0	0.45	ug/L			11/19/21 13:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*62 - 137*		*11/19/21 13:43*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/19/21 13:43*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/19/21 13:43*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/19/21 13:43*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159710-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159610-C-1 MS	Matrix Spike	108	90	110	99
240-159610-C-1 MSD	Matrix Spike Duplicate	103	86	103	95
240-159710-1	TRIP BLANK_80	104	84	111	100
240-159710-2	MW-149S_110821	116	70	89	96
LCS 240-513594/4	Lab Control Sample	95	85	109	92
LCS 240-513806/4	Lab Control Sample	98	94	104	84
MB 240-513594/6	Method Blank	99	77	108	96
MB 240-513806/7	Method Blank	112	76	91	92

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159636-H-2 MS	Matrix Spike	77
240-159636-N-2 MSD	Matrix Spike Duplicate	77
240-159710-2	MW-149S_110821	75
LCS 240-513479/4	Lab Control Sample	78
MB 240-513479/5	Method Blank	77

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513594/6
Matrix: Water
Analysis Batch: 513594

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 11:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 11:52	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 11:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 11:52	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 11:52	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 11:52	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/18/21 11:52*	*1*
4-Bromofluorobenzene (Surr)	*77*		*56 - 136*		*11/18/21 11:52*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/18/21 11:52*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/18/21 11:52*	*1*

Lab Sample ID: LCS 240-513594/4
Matrix: Water
Analysis Batch: 513594

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.26		ug/L		93	63 - 134
cis-1,2-Dichloroethene	10.0	11.0		ug/L		110	77 - 123
Tetrachloroethene	10.0	11.0		ug/L		110	76 - 123
trans-1,2-Dichloroethene	10.0	10.6		ug/L		106	75 - 124
Trichloroethene	10.0	8.93		ug/L		89	70 - 122
Vinyl chloride	10.0	8.24		ug/L		82	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*95*		*62 - 137*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*
Toluene-d8 (Surr)	*109*		*78 - 122*
Dibromofluoromethane (Surr)	*92*		*73 - 120*

Lab Sample ID: 240-159610-C-1 MS
Matrix: Water
Analysis Batch: 513594

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	5900		33300	38800		ug/L		99	56 - 135
cis-1,2-Dichloroethene	6900		33300	42600		ug/L		107	66 - 128
Tetrachloroethene	14000		33300	49400		ug/L		105	62 - 131
trans-1,2-Dichloroethene	3300	U	33300	34500		ug/L		103	56 - 136
Trichloroethene	2500	J	33300	33000		ug/L		92	61 - 124
Vinyl chloride	3300	U	33300	25600		ug/L		77	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*108*		*62 - 137*
4-Bromofluorobenzene (Surr)	*90*		*56 - 136*
Toluene-d8 (Surr)	*110*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159610-C-1 MS
Matrix: Water
Analysis Batch: 513594

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	99		73 - 120

Lab Sample ID: 240-159610-C-1 MSD
Matrix: Water
Analysis Batch: 513594

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	5900		33300	37600		ug/L		95	56 - 135	3	26
cis-1,2-Dichloroethene	6900		33300	38000		ug/L		93	66 - 128	11	14
Tetrachloroethene	14000		33300	47100		ug/L		99	62 - 131	5	20
trans-1,2-Dichloroethene	3300	U	33300	31300		ug/L		94	56 - 136	10	15
Trichloroethene	2500	J	33300	30800		ug/L		85	61 - 124	7	15
Vinyl chloride	3300	U	33300	25000		ug/L		75	43 - 157	2	24

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	103		62 - 137
4-Bromofluorobenzene (Surr)	86		56 - 136
Toluene-d8 (Surr)	103		78 - 122
Dibromofluoromethane (Surr)	95		73 - 120

Lab Sample ID: MB 240-513806/7
Matrix: Water
Analysis Batch: 513806

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 12:37	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 12:37	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 12:37	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 12:37	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 12:37	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 12:37	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	112		62 - 137		11/19/21 12:37	1
4-Bromofluorobenzene (Surr)	76		56 - 136		11/19/21 12:37	1
Toluene-d8 (Surr)	91		78 - 122		11/19/21 12:37	1
Dibromofluoromethane (Surr)	92		73 - 120		11/19/21 12:37	1

Lab Sample ID: LCS 240-513806/4
Matrix: Water
Analysis Batch: 513806

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	7.99		ug/L		80	63 - 134
cis-1,2-Dichloroethene	10.0	9.65		ug/L		96	77 - 123
Tetrachloroethene	10.0	9.29		ug/L		93	76 - 123
trans-1,2-Dichloroethene	10.0	10.2		ug/L		102	75 - 124
Trichloroethene	10.0	8.38		ug/L		84	70 - 122

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-513806/4
Matrix: Water
Analysis Batch: 513806

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Vinyl chloride			10.0	8.94		ug/L		89	60 - 144		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*
Toluene-d8 (Surr)	*104*		*78 - 122*
Dibromofluoromethane (Surr)	*84*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513479/5
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 17:41	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*		*11/17/21 17:41*	*1*

Lab Sample ID: LCS 240-513479/4
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	11.9		ug/L		119	80 - 122		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*

Lab Sample ID: 240-159636-H-2 MS
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

Lab Sample ID: 240-159636-N-2 MSD
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153	0	16

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159636-N-2 MSD
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159710-1

GC/MS VOA

Analysis Batch: 513479

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159710-2	MW-149S_110821	Total/NA	Water	8260B SIM	
MB 240-513479/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513479/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159636-H-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159636-N-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513594

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159710-1	TRIP BLANK_80	Total/NA	Water	8260B	
MB 240-513594/6	Method Blank	Total/NA	Water	8260B	
LCS 240-513594/4	Lab Control Sample	Total/NA	Water	8260B	
240-159610-C-1 MS	Matrix Spike	Total/NA	Water	8260B	
240-159610-C-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 513806

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159710-2	MW-149S_110821	Total/NA	Water	8260B	
MB 240-513806/7	Method Blank	Total/NA	Water	8260B	
LCS 240-513806/4	Lab Control Sample	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159710-1

Client Sample ID: TRIP BLANK_80

Lab Sample ID: 240-159710-1

Date Collected: 11/08/21 00:00

Matrix: Water

Date Received: 11/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513594	11/18/21 14:06	LEE	TAL CAN

Client Sample ID: MW-149S_110821

Lab Sample ID: 240-159710-2

Date Collected: 11/08/21 11:02

Matrix: Water

Date Received: 11/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513806	11/19/21 13:43	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513479	11/18/21 00:43	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159710-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No: 1 of 1 COCs
Phone: 248-994-2240	Sampler Name: Sommer Guy	TAT if different from below ☐	For lab use only
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:	10 day ☑ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day	Walk-in client
Project Number: 30080642.402.04	Shipping/Tracking No:		Lab sampling
PO # 30080642.402.04			Job/SDG No:

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_80	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1495_110821	11/8/21	11:02		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159710 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Sommer Guy	Arcadis	11/8/21 15:30	Novi Cold Storage	Arcadis	11/8/21 15:30
[illegible]	ARCADIS	11/9/21 1040	[illegible]	ETA	11/9/21 1040
[illegible]	ETA	11/9/21 1055	[illegible]	ETA	11-10-21 8:00

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11/24/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 159710
Canton Facility

Client Arcadis Site Name

Cooler Received on 11-10-21 Opened on 11-10-21

Cooler unpacked by: Marilyn Bleau

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity_____	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC157842
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #_____	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

No SIM on TB per Corrected COC. (mw) 11-10-21

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

Login # : 159710

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form				
Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
TA Client Box Other	IR-14 IR-15	0.6	0.7	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15	0.7	0.8	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15	

DATA VERIFICATION REPORT

November 25, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159710-1
Sample date: 2021-11-08
Report received by CADENA: 2021-11-24
Initial Data Verification completed by CADENA: 2021-11-25
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159710-1

		Sample Name:	TRIP BLANK_80				MW-149S_110821			
		Lab Sample ID:	2401597101				2401597102			
		Sample Date:	11/8/2021				11/8/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	1.5	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

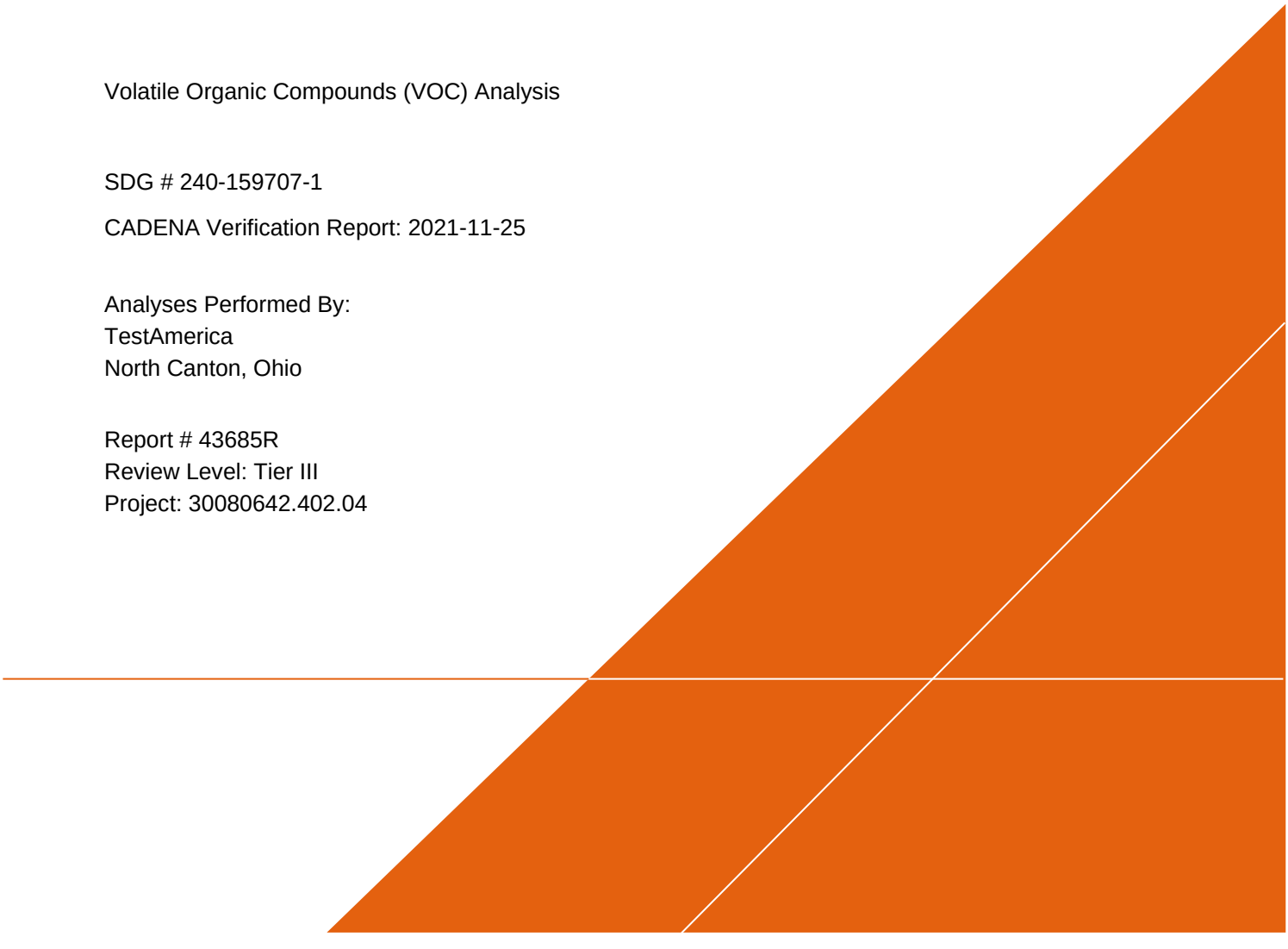
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159707-1

CADENA Verification Report: 2021-11-25

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43685R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159707-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_80	240-159707-1	Water	11/08/21		X	
MW-149S_110821	240-159707-2	Water	11/08/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Compound	Criteria
TRIP BLANK_80	Continuous Calibration Verification %D	Vinyl chloride	-22.1%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	

Initial/Continuing	Criteria	Sample Result	Qualification
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 10, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 14, 2021

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Sommer Guy	TAT if different from below: 10 day; 3 weeks / 2 weeks / 1 week / 2 days / 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_80	—	—		X						1					N	G	X	X	X	X	X	X		1 Trip Blank
MW-1495_110821	11/8/21	11:02		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159710 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Sommer Guy	Arcadis	11/8/21 15:30	Novi Cold Storage	Arcadis	11/8/21 15:30
[signature]	ARCADIS	11/9/21 1040	[signature]	ETA	11/9/21 1040
[signature]	ETA	11/9/21 1055	Mandy Blow	ETA	11-10-21 8:00

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Client Sample ID: TRIP BLANK_80
Lab Sample ID: 240-159710-1

Date Collected: 11/08/21 00:00
Matrix: Water
Date Received: 11/10/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 14:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 14:06	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 14:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 14:06	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 14:06	1
Vinyl chloride	1.0	~~U~~ UJ	1.0	0.45	ug/L			11/18/21 14:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*62 - 137*		*11/18/21 14:06*	*1*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*		*11/18/21 14:06*	*1*
Toluene-d8 (Surr)	*111*		*78 - 122*		*11/18/21 14:06*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/18/21 14:06*	*1*

Client Sample ID: MW-149S_110821
Lab Sample ID: 240-159710-2

Date Collected: 11/08/21 11:02
Matrix: Water
Date Received: 11/10/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 00:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*		*11/18/21 00:43*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 13:43	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 13:43	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 13:43	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 13:43	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 13:43	1
Vinyl chloride	**1.5**		1.0	0.45	ug/L			11/19/21 13:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*62 - 137*		*11/19/21 13:43*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/19/21 13:43*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/19/21 13:43*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/19/21 13:43*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159958-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/29/2021 8:36:19 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159958-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159958-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159958-1

Comments
No additional comments.

Receipt
The samples were received on 11/12/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.6° C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) associated with batch 513804 recovered above the upper control limit for Vinyl Chloride. The samples associated with this CCV were non-detect for the affected analyte; therefore, the data have been reported. The associated samples are impacted: TRIP BLANK_112 (240-159958-1) and MW-168S_111021 (240-159958-2).

Method 8260B: The laboratory control sample (LCS) for 513804 recovered outside control limits for Tetrachloroethene. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159958-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159958-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159958-1	TRIP BLANK_112	Water	11/10/21 00:00	11/12/21 08:00
240-159958-2	MW-168S_111021	Water	11/10/21 15:00	11/12/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159958-1

Client Sample ID: TRIP BLANK_112 — Lab Sample ID: 240-159958-1

No Detections.

Client Sample ID: MW-168S_111021 — Lab Sample ID: 240-159958-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159958-1

Client Sample ID: TRIP BLANK_112

Date Collected: 11/10/21 00:00
Date Received: 11/12/21 08:00

Lab Sample ID: 240-159958-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 19:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 19:22	1
Tetrachloroethene	1.0	U *+	1.0	0.44	ug/L			11/19/21 19:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 19:22	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 19:22	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 19:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/19/21 19:22*	*1*
4-Bromofluorobenzene (Surr)	*76*		*56 - 136*		*11/19/21 19:22*	*1*
Toluene-d8 (Surr)	*115*		*78 - 122*		*11/19/21 19:22*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/19/21 19:22*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159958-1

Client Sample ID: MW-168S_111021

Date Collected: 11/10/21 15:00
Date Received: 11/12/21 08:00

Lab Sample ID: 240-159958-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 03:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*		*11/18/21 03:56*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 19:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 19:44	1
Tetrachloroethene	1.0	U *+	1.0	0.44	ug/L			11/19/21 19:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 19:44	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 19:44	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 19:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*		*11/19/21 19:44*	*1*
4-Bromofluorobenzene (Surr)	*74*		*56 - 136*		*11/19/21 19:44*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/19/21 19:44*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*11/19/21 19:44*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159958-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159953-A-2 MS	Matrix Spike	100	85	115	96
240-159953-D-2 MSD	Matrix Spike Duplicate	99	87	112	92
240-159958-1	TRIP BLANK_112	105	76	115	99
240-159958-2	MW-168S_111021	100	74	108	95
LCS 240-513804/4	Lab Control Sample	100	87	118	98
MB 240-513804/6	Method Blank	105	81	118	101

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159642-H-3 MS	Matrix Spike	87
240-159642-M-3 MSD	Matrix Spike Duplicate	87
240-159958-2	MW-168S_111021	87
LCS 240-513480/3	Lab Control Sample	84
MB 240-513480/4	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513804/6
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 15:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 15:38	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 15:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 15:38	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 15:38	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 15:38	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/19/21 15:38*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/19/21 15:38*	*1*
Toluene-d8 (Surr)	*118*		*78 - 122*		*11/19/21 15:38*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/19/21 15:38*	*1*

Lab Sample ID: LCS 240-513804/4
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	11.0		ug/L		110	63 - 134
cis-1,2-Dichloroethene	10.0	11.0		ug/L		110	77 - 123
Tetrachloroethene	10.0	13.0	*+	ug/L		130	76 - 123
trans-1,2-Dichloroethene	10.0	10.8		ug/L		108	75 - 124
Trichloroethene	10.0	9.54		ug/L		95	70 - 122
Vinyl chloride	10.0	11.1		ug/L		111	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*118*		*78 - 122*
Dibromofluoromethane (Surr)	*98*		*73 - 120*

Lab Sample ID: 240-159953-A-2 MS
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	10.3		ug/L		103	66 - 128
Tetrachloroethene	1.0	U *+	10.0	10.2		ug/L		102	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	56 - 136
Trichloroethene	1.0	U	10.0	8.59		ug/L		86	61 - 124
Vinyl chloride	1.0	U	10.0	10.2		ug/L		102	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*
Toluene-d8 (Surr)	*115*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159953-A-2 MS
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	96		73 - 120

Lab Sample ID: 240-159953-D-2 MSD
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.86		ug/L		99	56 - 135	5	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.79		ug/L		98	66 - 128	5	14
Tetrachloroethene	1.0	U *+	10.0	9.63		ug/L		96	62 - 131	6	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.82		ug/L		98	56 - 136	5	15
Trichloroethene	1.0	U	10.0	8.28		ug/L		83	61 - 124	4	15
Vinyl chloride	1.0	U	10.0	10.7		ug/L		107	43 - 157	5	24

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	99		62 - 137
4-Bromofluorobenzene (Surr)	87		56 - 136
Toluene-d8 (Surr)	112		78 - 122
Dibromofluoromethane (Surr)	92		73 - 120

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513480/4
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 19:58	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	84		66 - 120		11/17/21 19:58	1

Lab Sample ID: LCS 240-513480/3
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.37		ug/L		94	80 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	84		66 - 120

Lab Sample ID: 240-159642-H-3 MS
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.3		ug/L		103	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

Lab Sample ID: 240-159642-M-3 MSD
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.57		ug/L		96	51 - 153	7	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

GC/MS VOA

Analysis Batch: 513480

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159958-2	MW-168S_111021	Total/NA	Water	8260B SIM	
MB 240-513480/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513480/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159642-H-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159642-M-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513804

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159958-1	TRIP BLANK_112	Total/NA	Water	8260B	
240-159958-2	MW-168S_111021	Total/NA	Water	8260B	
MB 240-513804/6	Method Blank	Total/NA	Water	8260B	
LCS 240-513804/4	Lab Control Sample	Total/NA	Water	8260B	
240-159953-A-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159953-D-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159958-1

Client Sample ID: TRIP BLANK_112

Lab Sample ID: 240-159958-1

Date Collected: 11/10/21 00:00

Matrix: Water

Date Received: 11/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513804	11/19/21 19:22	LEE	TAL CAN

Client Sample ID: MW-168S_111021

Lab Sample ID: 240-159958-2

Date Collected: 11/10/21 15:00

Matrix: Water

Date Received: 11/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513804	11/19/21 19:44	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513480	11/18/21 03:56	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159958-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratories, Inc.

Client Contact

Company Name: Arcadis

Address: 28550 Cabot Drive, Suite 500

City/State/Zip: Novi, MI, 48377

Phone: 248-994-2240

Project Name: Ford LTP ON-Site

Project Number: [redacted]

PO #: [redacted]

Client Project Manager: Kelly Hastings

Telephone: [redacted]

Email: [redacted]

Sampler Name: Sommer Gray

Method of Shipment/Carrier:

Shipper/Tracking No.:

Site Contact: Julia McCluskey

Telephone: 734-844-6131

Lab Contact: Mike DeMarco

Telephone: 330-497-9396

Analysis Turnaround Time

TAT if different from below:

10 day — 3 weeks / 2 weeks / 1 week / 2 days / 1 day

Analyses

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: HNO3	H2SO4	HCl	NaOH	Zn Acetate	Other	Filtered Sample (Y / N)	Composite (C) / Grab (G)	TCL+CDE 8260B	1,2,4-TCB 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions
TRIP BLANK_112	—	—		X						1				N	G	X	X	X	X	X	X		1 Trip Blank
MW-168S-111021	11/16/21	15:00		X						6				N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

Corrected Sample ID:

MW-168S_111021

Corrected 11/16/21
C.Weaver

240-159958 Chain of Custody

Possible Hazard Identification: Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / Disposal By Lab / Archive For / Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cameo at [redacted] Cameo #[redacted]

Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Sommer Gray	Arcadis	11/16/21 16:00	Door Lock Storage	Arcadis	11/16/21 16:00
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[redacted]	ARCADIS	11/11/21 0950	[redacted]	ETA	11/11/21 0950
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
[redacted]	ETA	11-11-21 1046	[redacted]	ETN	11/12/21 8:45

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159958**
Canton Facility

Client Arcadis Site Name

Cooler Received on 11/12/21 Opened on 11/12/21

Cooler unpacked by: Matthew Surma

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp 0.5 °C Corrected Cooler Temp. 0.6 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No N.A.
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# HC157842
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ____ (Yes) No
17. Was a LL Hg or Me Hg trip blank present? ____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

NO SIM on TB per Corrected COC. DMR 11/12/21
The Sample ID on the COC = MW-1685_110221 does not match the ~~number~~ ID on the bottle labels.
DMR 11/12/21

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

November 29, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159958-1
Sample date: 2021-11-10
Report received by CADENA: 2021-11-29
Initial Data Verification completed by CADENA: 2021-11-29
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 513804 LCS recovery was outlying biased high for the following analyte: TETRACHLOROETHENE. Associated client sample results were non-detect so qualification was not required based on this high bias QC outlier.

GCMS VOC QC batch CCV response outliers as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159958-1

		Sample Name:	TRIP BLANK_112				MW-168S_111021			
		Lab Sample ID:	2401599581				2401599582			
		Sample Date:	11/10/2021				11/10/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

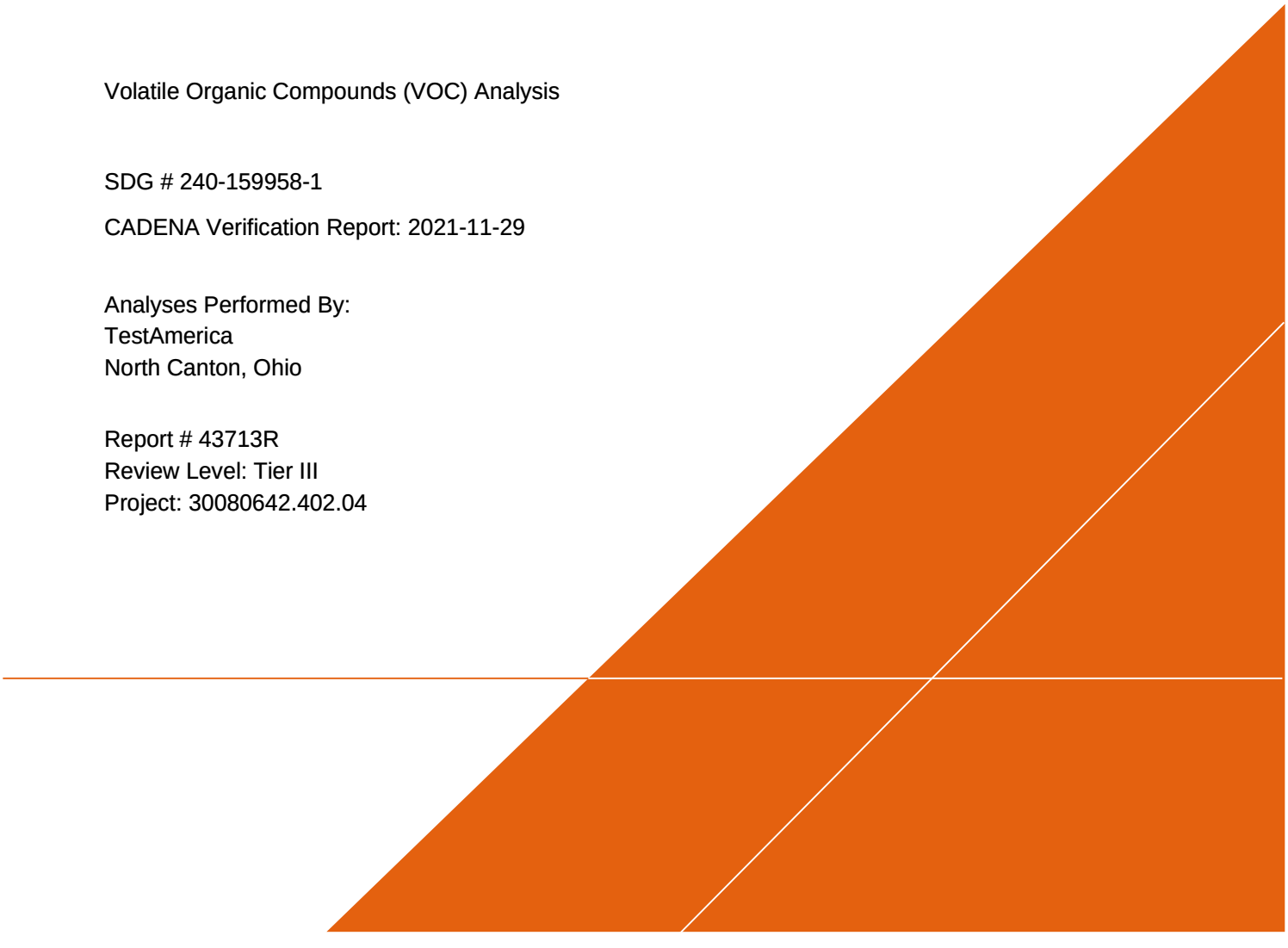
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159958-1

CADENA Verification Report: 2021-11-29

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43713R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159958-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_112	240-159958-1	Water	11/10/21		X	
MW-168S_111021	240-159958-2	Water	11/10/21		X	X

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Compound	Criteria
TRIP BLANK_112 MW-168S_111021	Continuous Calibration Verification %D	Vinyl chloride	+30.0%
		cis-1,2-Dichloroethene	+20.5%
		Tetrachloroethene	+21.1%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J

Initial/Continuing	Criteria	Sample Result	Qualification
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	☐ DW ☐ NPDES ☐ RCRA ☐ Other	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500		Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377		Sampler Name: Sommer Guy	TAT if different from below: 10 day ☑ 2 weeks; 3 weeks; 1 week; 2 days; 1 day		Walk-in client
Phone: 248-994-2240		Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site		Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04					
PO # 30080642.402.04					

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8280B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_112	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-168S-110221	11/10/21	15:00		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

Corrected Sample ID:

MW-168S_111021

Corrected 11/16/21
C.Weaver

240-159958 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal ByLab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: Sommer Guy	Arcadis	11/10/21 1600	Received by: Novi Cold Storage	Arcadis	11/10/21 1600
Relinquished by: [signature]	ARCADIS	11/11/21 0950	Received by: [signature]	ETA	11/11/21 0950
Relinquished by: [signature]	ETA	11-11-21 1046	Received in Laboratory by: M. D.	ETA	11/12/21 800

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Client Sample ID: TRIP BLANK_112
Lab Sample ID: 240-159958-1
Date Collected: 11/10/21 00:00
Matrix: Water
Date Received: 11/12/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 19:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 19:22	1
Tetrachloroethene	1.0	U *+	1.0	0.44	ug/L			11/19/21 19:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 19:22	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 19:22	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 19:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/19/21 19:22*	
4-Bromofluorobenzene (Surr)	*76*		*56 - 136*		*11/19/21 19:22*	
Toluene-d8 (Surr)	*115*		*78 - 122*		*11/19/21 19:22*	
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/19/21 19:22*	

Client Sample ID: MW-168S_111021
Lab Sample ID: 240-159958-2
Date Collected: 11/10/21 15:00
Matrix: Water
Date Received: 11/12/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 03:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*		*11/18/21 03:56*	

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 19:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 19:44	1
Tetrachloroethene	1.0	U *+	1.0	0.44	ug/L			11/19/21 19:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 19:44	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 19:44	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 19:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*		*11/19/21 19:44*	
4-Bromofluorobenzene (Surr)	*74*		*56 - 136*		*11/19/21 19:44*	
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/19/21 19:44*	
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*11/19/21 19:44*	

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159520-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/22/2021 8:06:51 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159520-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159520-1

Job ID: 240-159520-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159520-1

Comments
No additional comments.

Receipt
The samples were received on 11/6/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.3º C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) for analytical batch 512819 exceeded control criteria for Vinyl Chloride. The samples associated with this CCV were non-detect for the affected analytes. In accordance with the laboratory SOP, a low level CCV at the reporting limit (labeled as an MRL) was analyzed and the affected compounds were detected; therefore the data has been reported. No further corrective action was required: TRIP BLANK_52 (240-159520-1) and MW-152S_110421 (240-159520-2).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159520-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159520-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159520-1	TRIP BLANK_52	Water	11/04/21 00:00	11/06/21 08:00
240-159520-2	MW-152S_110421	Water	11/04/21 16:25	11/06/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159520-1

Client Sample ID: TRIP BLANK_52 — Lab Sample ID: 240-159520-1

No Detections.

Client Sample ID: MW-152S_110421 — Lab Sample ID: 240-159520-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159520-1

Client Sample ID: TRIP BLANK_52
Date Collected: 11/04/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159520-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 18:41	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 18:41	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 18:41	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 18:41	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 18:41	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 18:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*126*		*62 - 137*		*11/13/21 18:41*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/13/21 18:41*	*1*
Toluene-d8 (Surr)	*87*		*78 - 122*		*11/13/21 18:41*	*1*
Dibromofluoromethane (Surr)	*113*		*73 - 120*		*11/13/21 18:41*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159520-1

Client Sample ID: MW-152S_110421
Date Collected: 11/04/21 16:25
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159520-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 03:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*11/12/21 03:02*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 19:03	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 19:03	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 19:03	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 19:03	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 19:03	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 19:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*130*		*62 - 137*		*11/13/21 19:03*	*1*
4-Bromofluorobenzene (Surr)	*67*		*56 - 136*		*11/13/21 19:03*	*1*
Toluene-d8 (Surr)	*88*		*78 - 122*		*11/13/21 19:03*	*1*
Dibromofluoromethane (Surr)	*113*		*73 - 120*		*11/13/21 19:03*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159520-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159520-1	TRIP BLANK_52	126	70	87	113
240-159520-2	MW-152S_110421	130	67	88	113
240-159546-H-2 MSD	Matrix Spike Duplicate	102	98	101	91
240-159546-K-2 MS	Matrix Spike	105	96	102	93
LCS 240-512819/4	Lab Control Sample	100	99	100	91
MB 240-512819/7	Method Blank	119	75	89	102

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159418-H-2 MS	Matrix Spike	82
240-159418-P-2 MSD	Matrix Spike Duplicate	83
240-159520-2	MW-152S_110421	82
LCS 240-512585/4	Lab Control Sample	81
MB 240-512585/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512819/7
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 13:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 13:57	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 13:57	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:57	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 13:57	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*62 - 137*		*11/13/21 13:57*	*1*
4-Bromofluorobenzene (Surr)	*75*		*56 - 136*		*11/13/21 13:57*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/13/21 13:57*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/13/21 13:57*	*1*

Lab Sample ID: LCS 240-512819/4
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.01		ug/L		90	63 - 134
cis-1,2-Dichloroethene	10.0	10.7		ug/L		107	77 - 123
Tetrachloroethene	10.0	9.49		ug/L		95	76 - 123
trans-1,2-Dichloroethene	10.0	11.0		ug/L		110	75 - 124
Trichloroethene	10.0	9.48		ug/L		95	70 - 122
Vinyl chloride	10.0	8.38		ug/L		84	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*99*		*56 - 136*
Toluene-d8 (Surr)	*100*		*78 - 122*
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Lab Sample ID: 240-159546-H-2 MSD
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	8.50		ug/L		85	56 - 135	11	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.62		ug/L		96	66 - 128	1	14
Tetrachloroethene	1.0	U	10.0	8.67		ug/L		87	62 - 131	16	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.76		ug/L		98	56 - 136	3	15
Trichloroethene	1.0	U	10.0	8.44		ug/L		84	61 - 124	9	15
Vinyl chloride	1.0	U	10.0	7.09		ug/L		71	43 - 157	3	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*
4-Bromofluorobenzene (Surr)	*98*		*56 - 136*
Toluene-d8 (Surr)	*101*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159546-H-2 MSD
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Lab Sample ID: 240-159546-K-2 MS
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	7.61		ug/L		76	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.48		ug/L		95	66 - 128
Tetrachloroethene	1.0	U	10.0	7.41		ug/L		74	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.49		ug/L		95	56 - 136
Trichloroethene	1.0	U	10.0	7.75		ug/L		77	61 - 124
Vinyl chloride	1.0	U	10.0	7.30		ug/L		73	43 - 157

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*
4-Bromofluorobenzene (Surr)	*96*		*56 - 136*
Toluene-d8 (Surr)	*102*		*78 - 122*
Dibromofluoromethane (Surr)	*93*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512585/5
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/11/21 19:04	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/11/21 19:04*	*1*

Lab Sample ID: LCS 240-512585/4
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.86		ug/L		99	80 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*

Lab Sample ID: 240-159418-H-2 MS
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	11.1		ug/L		111	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159418-P-2 MSD
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.2		ug/L		102	51 - 153	8	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159520-1

GC/MS VOA

Analysis Batch: 512585

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159520-2	MW-152S_110421	Total/NA	Water	8260B SIM	
MB 240-512585/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512585/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159418-H-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159418-P-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 512819

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159520-1	TRIP BLANK_52	Total/NA	Water	8260B	
240-159520-2	MW-152S_110421	Total/NA	Water	8260B	
MB 240-512819/7	Method Blank	Total/NA	Water	8260B	
LCS 240-512819/4	Lab Control Sample	Total/NA	Water	8260B	
240-159546-H-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	
240-159546-K-2 MS	Matrix Spike	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159520-1

Client Sample ID: TRIP BLANK_52

Lab Sample ID: 240-159520-1

Date Collected: 11/04/21 00:00

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512819	11/13/21 18:41	LEE	TAL CAN

Client Sample ID: MW-152S_110421

Lab Sample ID: 240-159520-2

Date Collected: 11/04/21 16:25

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512819	11/13/21 19:03	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512585	11/12/21 03:02	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159520-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN
190

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Sam Hinkle CHRISTINA WEAVER-COURIER		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30080642.402.04	Shipping/Tracking No:		
PO # 30080642.402.04			

COC No:

1 of 1 COCs

For lab use only
Walk-in client
Lab sampling
Job/SDG No:

Analysis Turnaround Time
TAT if different from below
☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day
10 day

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_52	---	---		X						1					N	G	X	X	X	X	X	X	~~X~~	1 Trip Blank
MW-1523_110421	11/4/21	16:25		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159520 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
SH [signature]	Arcadis	11/4/21 18:11	NOVI COLD STORAGE	ARCADIS	11/4/21 / 18:11
[signature]	ARCADIS	11/5/21 1435	[signature]	ETA	11/5/21 / 1435
[signature]	ETA	11/5/21 1445	Received in Laboratory by: M.A.A.	Company: ETA	Date/Time: 11/6/21 8:00

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 159526

Client ARCADIS Site Name

Cooler unpacked by: Matthew Surna

Cooler Received on 11/6/21 Opened on 11/6/21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.2 °C Corrected Cooler Temp. 0.3 °C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# HC157842
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 01042016	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present?	Yes	(No)

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.

Sample(s) were received in a broken container.

Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.

Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

DATA VERIFICATION REPORT

November 22, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159520-1
Sample date: 2021-11-04
Report received by CADENA: 2021-11-22
Initial Data Verification completed by CADENA: 2021-11-22
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159520-1

		Sample Name:	TRIP BLANK_52				MW-152S_110421			
		Lab Sample ID:	2401595201				2401595202			
		Sample Date:	11/4/2021				11/4/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

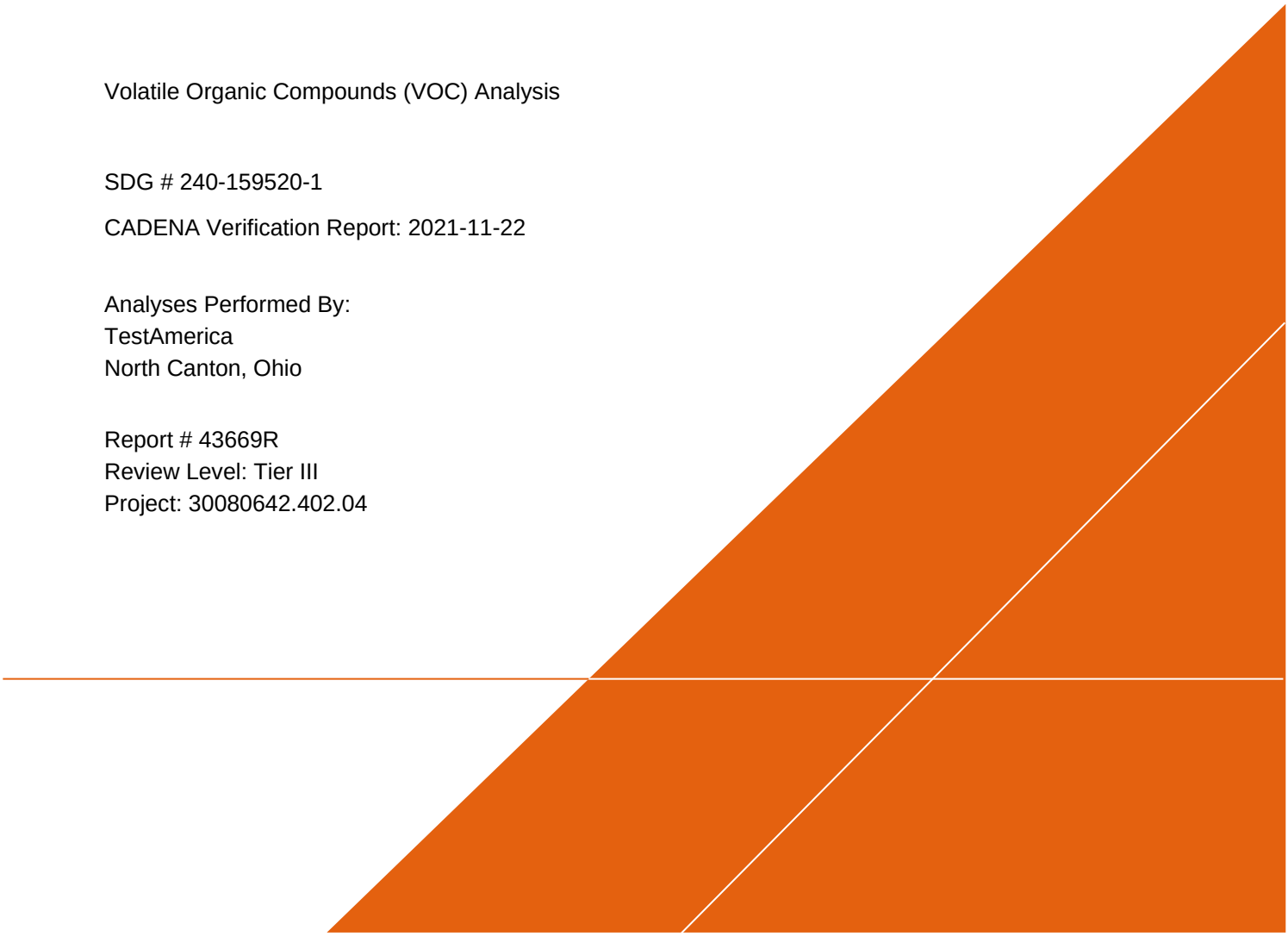
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159520-1

CADENA Verification Report: 2021-11-22

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43669R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159520-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_52	240-159520-1	Water	11/04/21		X	
MW-152S_110421	240-159520-2	Water	11/04/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Compound	Criteria
TRIP BLANK_52 MW-152S_110421	Continuous Calibration Verification %D	Vinyl chloride	-21.2%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	

Initial/Continuing	Criteria	Sample Result	Qualification
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 09, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 09, 2021

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Sam Hinskey / CHRISTINA WEAVER-COURIER	TAT if different from below ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_52	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1523_110421	11/4/21	16:25		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159520 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by: SH	Arcadis	11/4/21 18:11	NOVI COLD STORAGE	ARCADIS	11/4/21 / 18:11
Relinquished by:	Company: ARCADIS	Date/Time: 11/5/21 1435	Received by:	Company: ETA	Date/Time: 11/5/21 / 1435
Relinquished by:	Company: ETA	Date/Time: 11/5/21 1445	Received in Laboratory by: M.A.A.	Company: ETA	Date/Time: 11/6/21 8:00

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11/22/2021

Client Sample ID: TRIP BLANK_52
Lab Sample ID: 240-159520-1
Date Collected: 11/04/21 00:00
Matrix: Water
Date Received: 11/06/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 18:41	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 18:41	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 18:41	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 18:41	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 18:41	1
Vinyl chloride	1.0	~~U~~ UJ	1.0	0.45	ug/L			11/13/21 18:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*126*		*62 - 137*		*11/13/21 18:41*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/13/21 18:41*	*1*
Toluene-d8 (Surr)	*87*		*78 - 122*		*11/13/21 18:41*	*1*
Dibromofluoromethane (Surr)	*113*		*73 - 120*		*11/13/21 18:41*	*1*

Client Sample ID: MW-152S_110421
Lab Sample ID: 240-159520-2
Date Collected: 11/04/21 16:25
Matrix: Water
Date Received: 11/06/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 03:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*11/12/21 03:02*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 19:03	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 19:03	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 19:03	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 19:03	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 19:03	1
Vinyl chloride	1.0	~~U~~ UJ	1.0	0.45	ug/L			11/13/21 19:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*130*		*62 - 137*		*11/13/21 19:03*	*1*
4-Bromofluorobenzene (Surr)	*67*		*56 - 136*		*11/13/21 19:03*	*1*
Toluene-d8 (Surr)	*88*		*78 - 122*		*11/13/21 19:03*	*1*
Dibromofluoromethane (Surr)	*113*		*73 - 120*		*11/13/21 19:03*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159833-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/26/2021 7:55:19 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159833-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159833-1

Job ID: 240-159833-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159833-1

Comments
No additional comments.

Receipt
The samples were received on 11/11/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 4.6º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159833-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159833-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159833-1	TRIP BLANK_83	Water	11/09/21 00:00	11/11/21 08:00
240-159833-2	MW-163S_110921	Water	11/09/21 11:05	11/11/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159833-1

Client Sample ID: TRIP BLANK_83 — Lab Sample ID: 240-159833-1

No Detections.

Client Sample ID: MW-163S_110921 — Lab Sample ID: 240-159833-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159833-1

Client Sample ID: TRIP BLANK_83

Date Collected: 11/09/21 00:00
Date Received: 11/11/21 08:00

Lab Sample ID: 240-159833-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 16:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 16:22	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 16:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 16:22	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 16:22	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 16:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/18/21 16:22*	*1*
4-Bromofluorobenzene (Surr)	*83*		*56 - 136*		*11/18/21 16:22*	*1*
Toluene-d8 (Surr)	*92*		*78 - 122*		*11/18/21 16:22*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/18/21 16:22*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159833-1

Client Sample ID: MW-163S_110921
Date Collected: 11/09/21 11:05
Date Received: 11/11/21 08:00

Lab Sample ID: 240-159833-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/13/21 01:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*74*		*66 - 120*		*11/13/21 01:09*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 18:53	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 18:53	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 18:53	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 18:53	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 18:53	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 18:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/18/21 18:53*	*1*
4-Bromofluorobenzene (Surr)	*83*		*56 - 136*		*11/18/21 18:53*	*1*
Toluene-d8 (Surr)	*94*		*78 - 122*		*11/18/21 18:53*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/18/21 18:53*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159833-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159833-1	TRIP BLANK_83	92	83	92	99
240-159833-2	MW-163S_110921	93	83	94	100
240-159848-E-3 MS	Matrix Spike	89	93	92	95
240-159848-E-3 MSD	Matrix Spike Duplicate	86	95	94	94
LCS 240-513621/5	Lab Control Sample	87	90	95	94
MB 240-513621/8	Method Blank	90	84	93	99

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159541-G-2 MS	Matrix Spike	77
240-159541-M-2 MSD	Matrix Spike Duplicate	78
240-159833-2	MW-163S_110921	74
LCS 240-512785/4	Lab Control Sample	79
MB 240-512785/5	Method Blank	79

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513621/8
Matrix: Water
Analysis Batch: 513621

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 15:31	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 15:31	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 15:31	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 15:31	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 15:31	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 15:31	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*		*11/18/21 15:31*	*1*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*		*11/18/21 15:31*	*1*
Toluene-d8 (Surr)	*93*		*78 - 122*		*11/18/21 15:31*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/18/21 15:31*	*1*

Lab Sample ID: LCS 240-513621/5
Matrix: Water
Analysis Batch: 513621

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	26.8		ug/L		107	63 - 134
cis-1,2-Dichloroethene	25.0	24.6		ug/L		99	77 - 123
Tetrachloroethene	25.0	26.5		ug/L		106	76 - 123
trans-1,2-Dichloroethene	25.0	25.6		ug/L		102	75 - 124
Trichloroethene	25.0	25.5		ug/L		102	70 - 122
Vinyl chloride	25.0	20.1		ug/L		81	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*87*		*62 - 137*
4-Bromofluorobenzene (Surr)	*90*		*56 - 136*
Toluene-d8 (Surr)	*95*		*78 - 122*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: 240-159848-E-3 MS
Matrix: Water
Analysis Batch: 513621

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	2.0	U	50.0	52.2		ug/L		104	56 - 135
cis-1,2-Dichloroethene	2.0	U	50.0	52.0		ug/L		104	66 - 128
Tetrachloroethene	2.0	U	50.0	56.8		ug/L		114	62 - 131
trans-1,2-Dichloroethene	2.0	U	50.0	51.2		ug/L		102	56 - 136
Trichloroethene	2.0	U	50.0	51.9		ug/L		104	61 - 124
Vinyl chloride	2.0	U	50.0	41.8		ug/L		84	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*62 - 137*
4-Bromofluorobenzene (Surr)	*93*		*56 - 136*
Toluene-d8 (Surr)	*92*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159848-E-3 MS
Matrix: Water
Analysis Batch: 513621

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*95*		*73 - 120*

Lab Sample ID: 240-159848-E-3 MSD
Matrix: Water
Analysis Batch: 513621

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	2.0	U	50.0	49.7		ug/L		99	56 - 135	5	26
cis-1,2-Dichloroethene	2.0	U	50.0	48.6		ug/L		97	66 - 128	7	14
Tetrachloroethene	2.0	U	50.0	55.3		ug/L		111	62 - 131	3	20
trans-1,2-Dichloroethene	2.0	U	50.0	48.6		ug/L		97	56 - 136	5	15
Trichloroethene	2.0	U	50.0	49.9		ug/L		100	61 - 124	4	15
Vinyl chloride	2.0	U	50.0	38.6		ug/L		77	43 - 157	8	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*
4-Bromofluorobenzene (Surr)	*95*		*56 - 136*
Toluene-d8 (Surr)	*94*		*78 - 122*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512785/5
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 18:32	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*66 - 120*		*11/12/21 18:32*	*1*

Lab Sample ID: LCS 240-512785/4
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.7		ug/L		107	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*66 - 120*

Lab Sample ID: 240-159541-G-2 MS
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

Lab Sample ID: 240-159541-M-2 MSD
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.4		ug/L		104	51 - 153	2	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159833-1

GC/MS VOA

Analysis Batch: 512785

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159833-2	MW-163S_110921	Total/NA	Water	8260B SIM	
MB 240-512785/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512785/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159541-G-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159541-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513621

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159833-1	TRIP BLANK_83	Total/NA	Water	8260B	
240-159833-2	MW-163S_110921	Total/NA	Water	8260B	
MB 240-513621/8	Method Blank	Total/NA	Water	8260B	
LCS 240-513621/5	Lab Control Sample	Total/NA	Water	8260B	
240-159848-E-3 MS	Matrix Spike	Total/NA	Water	8260B	
240-159848-E-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159833-1

Client Sample ID: TRIP BLANK_83

Lab Sample ID: 240-159833-1

Date Collected: 11/09/21 00:00

Matrix: Water

Date Received: 11/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513621	11/18/21 16:22	SAM	TAL CAN

Client Sample ID: MW-163S_110921

Lab Sample ID: 240-159833-2

Date Collected: 11/09/21 11:05

Matrix: Water

Date Received: 11/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513621	11/18/21 18:53	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	512785	11/13/21 01:09	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159833-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Seth Turner	TAT if different from below		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:	10 day ✓ 2 weeks / 3 weeks / 1 week / 2 days / 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_83	—	—		X						1							X	X	X	X	X	X	X (MS)	1 Trip Blank
mw-1635_110921	11/9/21	1105		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159833 Chain of Custody

Possible Hazard Identification
✓ Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Return to Client ✓ Disposal By Lab Archive For Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Seth Turner	Arcadis	11/9/21 1330	NOVI Cold Storage	Arcadis	11/9/21 1330
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Arcadis	11/10/21 10:40		GTA	11/10/21 1041
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
	GTA	11/10/21 1041	Tammy Berger	ETA	11-11-21 800

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11/26/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159833**
Canton Facility

Client Arcadis Site Name

Cooler Received on 11-11-21 Opened on 11-11-21

Cooler unpacked by: Tammy Depp

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: ~~Bubble Wrap~~ Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 4.5 °C Corrected Cooler Temp. 4.6 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# **HC157842**
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 60358 (Yes) No
17. Was a LL Hg or Me Hg trip blank present? Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page | Samples processed by:

No SIM on TB per corrected COC. SMR 11/11/21

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container.
Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.
Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

DATA VERIFICATION REPORT

November 26, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159833-1
Sample date: 2021-11-09
Report received by CADENA: 2021-11-26
Initial Data Verification completed by CADENA: 2021-11-26
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159833-1

		Sample Name:	TRIP BLANK_83				MW-163S_110921			
		Lab Sample ID:	2401598331				2401598332			
		Sample Date:	11/9/2021				11/9/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

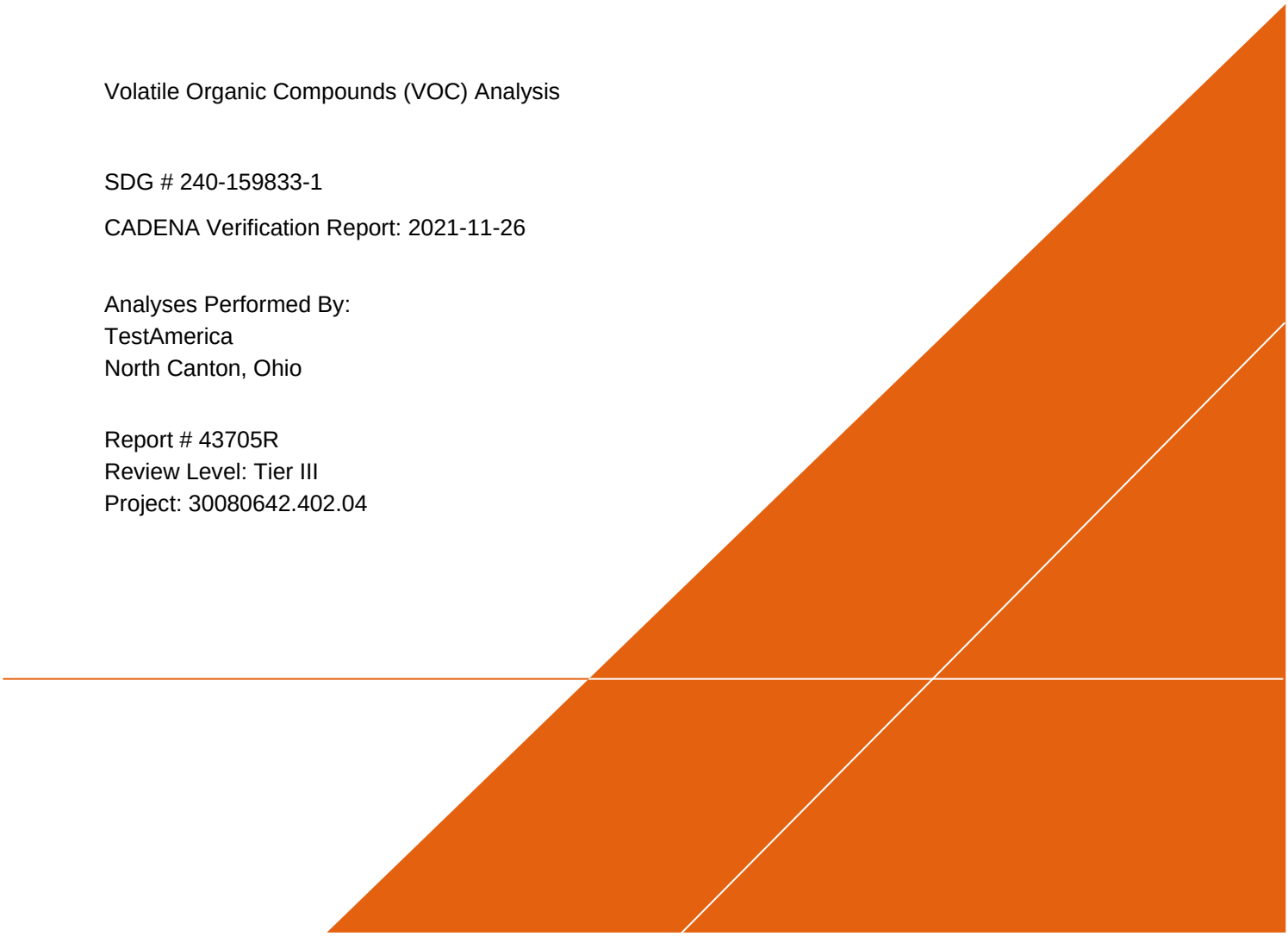
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159833-1

CADENA Verification Report: 2021-11-26

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43705R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159833-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_83	240-159833-1	Water	11/09/21		X	
MW-163S_110921	240-159833-2	Water	11/09/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 14, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 14, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Seth Turner	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_83	—	—		X						1							X	X	X	X	X	X	X	1 Trip Blank
mw-1635_110921	11/9/21	1105		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159833 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203531
Level IV Reporting requested.

	Company:	Date/Time:		Company:	Date/Time:
Relinquished by: Seth Turner	Arcadis	11/9/21 1330	Received by: Novi Cold Storage	Arcadis	11/9/21 1330
Relinquished by:	Arcadis	11/10/21 10:40	Received by:	ETA	11/10/21 1041
Relinquished by:	ETA	11/10/21 1041	Received in Laboratory by: Tammy Berger	ETA	11-11-21 800

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11/26/2021

Client Sample ID: TRIP BLANK_83
Lab Sample ID: 240-159833-1
Date Collected: 11/09/21 00:00
Matrix: Water
Date Received: 11/11/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 16:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 16:22	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 16:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 16:22	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 16:22	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 16:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/18/21 16:22*	*1*
4-Bromofluorobenzene (Surr)	*83*		*56 - 136*		*11/18/21 16:22*	*1*
Toluene-d8 (Surr)	*92*		*78 - 122*		*11/18/21 16:22*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/18/21 16:22*	*1*

Client Sample ID: MW-163S_110921
Lab Sample ID: 240-159833-2
Date Collected: 11/09/21 11:05
Matrix: Water
Date Received: 11/11/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/13/21 01:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*74*		*66 - 120*		*11/13/21 01:09*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 18:53	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 18:53	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 18:53	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 18:53	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 18:53	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 18:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/18/21 18:53*	*1*
4-Bromofluorobenzene (Surr)	*83*		*56 - 136*		*11/18/21 18:53*	*1*
Toluene-d8 (Surr)	*94*		*78 - 122*		*11/18/21 18:53*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/18/21 18:53*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159518-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/22/2021 8:06:12 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159518-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159518-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159518-1

Comments
No additional comments.

Receipt
The samples were received on 11/6/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.3º C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) for analytical batch 512819 exceeded control criteria for Vinyl Chloride. The samples associated with this CCV were non-detect for the affected analytes. In accordance with the laboratory SOP, a low level CCV at the reporting limit (labeled as an MRL) was analyzed and the affected compounds were detected; therefore the data has been reported. No further corrective action was required: TRIP BLANK_54 (240-159518-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159518-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159518-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159518-1	TRIP BLANK_54	Water	11/04/21 00:00	11/06/21 08:00
240-159518-2	MW-130S_110421	Water	11/04/21 13:00	11/06/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159518-1

Client Sample ID: TRIP BLANK_54 — Lab Sample ID: 240-159518-1

No Detections.

Client Sample ID: MW-130S_110421 — Lab Sample ID: 240-159518-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	2.3		1.0	0.45	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159518-1

Client Sample ID: TRIP BLANK_54
Date Collected: 11/04/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159518-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 17:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 17:57	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 17:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 17:57	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 17:57	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 17:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*127*		*62 - 137*		*11/13/21 17:57*	*1*
4-Bromofluorobenzene (Surr)	*66*		*56 - 136*		*11/13/21 17:57*	*1*
Toluene-d8 (Surr)	*86*		*78 - 122*		*11/13/21 17:57*	*1*
Dibromofluoromethane (Surr)	*110*		*73 - 120*		*11/13/21 17:57*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159518-1

Client Sample ID: MW-130S_110421
Date Collected: 11/04/21 13:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159518-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 02:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*11/12/21 02:38*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 18:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 18:19	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 18:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 18:19	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 18:19	1
Vinyl chloride	**2.3**		1.0	0.45	ug/L			11/15/21 13:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*125*		*62 - 137*		*11/13/21 18:19*	*1*
1,2-Dichloroethane-d4 (Surr)	*121*		*62 - 137*		*11/15/21 13:17*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/13/21 18:19*	*1*
4-Bromofluorobenzene (Surr)	*69*		*56 - 136*		*11/15/21 13:17*	*1*
Toluene-d8 (Surr)	*87*		*78 - 122*		*11/13/21 18:19*	*1*
Toluene-d8 (Surr)	*91*		*78 - 122*		*11/15/21 13:17*	*1*
Dibromofluoromethane (Surr)	*106*		*73 - 120*		*11/13/21 18:19*	*1*
Dibromofluoromethane (Surr)	*108*		*73 - 120*		*11/15/21 13:17*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159518-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159518-1	TRIP BLANK_54	127	66	86	110
240-159518-2	MW-130S_110421	125	70	87	106
240-159518-2	MW-130S_110421	121	69	91	108
240-159546-H-2 MSD	Matrix Spike Duplicate	102	98	101	91
240-159546-K-2 MS	Matrix Spike	105	96	102	93
240-159554-E-1 MSD	Matrix Spike Duplicate	101	101	102	91
240-159554-H-1 MS	Matrix Spike	107	101	102	98
LCS 240-512819/4	Lab Control Sample	100	99	100	91
LCS 240-512968/4	Lab Control Sample	103	100	101	93
MB 240-512819/7	Method Blank	119	75	89	102
MB 240-512968/7	Method Blank	120	74	89	106

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159418-H-2 MS	Matrix Spike	82
240-159418-P-2 MSD	Matrix Spike Duplicate	83
240-159518-2	MW-130S_110421	82
LCS 240-512585/4	Lab Control Sample	81
MB 240-512585/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512819/7
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 13:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 13:57	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 13:57	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:57	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 13:57	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*62 - 137*		*11/13/21 13:57*	*1*
4-Bromofluorobenzene (Surr)	*75*		*56 - 136*		*11/13/21 13:57*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/13/21 13:57*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/13/21 13:57*	*1*

Lab Sample ID: LCS 240-512819/4
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.01		ug/L		90	63 - 134
cis-1,2-Dichloroethene	10.0	10.7		ug/L		107	77 - 123
Tetrachloroethene	10.0	9.49		ug/L		95	76 - 123
trans-1,2-Dichloroethene	10.0	11.0		ug/L		110	75 - 124
Trichloroethene	10.0	9.48		ug/L		95	70 - 122
Vinyl chloride	10.0	8.38		ug/L		84	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*99*		*56 - 136*
Toluene-d8 (Surr)	*100*		*78 - 122*
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Lab Sample ID: 240-159546-H-2 MSD
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	8.50		ug/L		85	56 - 135	11	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.62		ug/L		96	66 - 128	1	14
Tetrachloroethene	1.0	U	10.0	8.67		ug/L		87	62 - 131	16	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.76		ug/L		98	56 - 136	3	15
Trichloroethene	1.0	U	10.0	8.44		ug/L		84	61 - 124	9	15
Vinyl chloride	1.0	U	10.0	7.09		ug/L		71	43 - 157	3	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*
4-Bromofluorobenzene (Surr)	*98*		*56 - 136*
Toluene-d8 (Surr)	*101*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159546-H-2 MSD
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Lab Sample ID: 240-159546-K-2 MS
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	7.61		ug/L		76	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.48		ug/L		95	66 - 128
Tetrachloroethene	1.0	U	10.0	7.41		ug/L		74	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.49		ug/L		95	56 - 136
Trichloroethene	1.0	U	10.0	7.75		ug/L		77	61 - 124
Vinyl chloride	1.0	U	10.0	7.30		ug/L		73	43 - 157

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*
4-Bromofluorobenzene (Surr)	*96*		*56 - 136*
Toluene-d8 (Surr)	*102*		*78 - 122*
Dibromofluoromethane (Surr)	*93*		*73 - 120*

Lab Sample ID: MB 240-512968/7
Matrix: Water
Analysis Batch: 512968

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/15/21 12:55	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/15/21 12:55	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 12:55	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/15/21 12:55	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 12:55	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/15/21 12:55	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*120*		*62 - 137*		*11/15/21 12:55*	*1*
4-Bromofluorobenzene (Surr)	*74*		*56 - 136*		*11/15/21 12:55*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/15/21 12:55*	*1*
Dibromofluoromethane (Surr)	*106*		*73 - 120*		*11/15/21 12:55*	*1*

Lab Sample ID: LCS 240-512968/4
Matrix: Water
Analysis Batch: 512968

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	7.79		ug/L		78	63 - 134
cis-1,2-Dichloroethene	10.0	10.4		ug/L		104	77 - 123
Tetrachloroethene	10.0	9.14		ug/L		91	76 - 123
trans-1,2-Dichloroethene	10.0	10.5		ug/L		105	75 - 124
Trichloroethene	10.0	9.43		ug/L		94	70 - 122

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-512968/4
Matrix: Water
Analysis Batch: 512968

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Vinyl chloride			10.0	7.99		ug/L		80	60 - 144		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*
4-Bromofluorobenzene (Surr)	*100*		*56 - 136*
Toluene-d8 (Surr)	*101*		*78 - 122*
Dibromofluoromethane (Surr)	*93*		*73 - 120*

Lab Sample ID: 240-159554-E-1 MSD
Matrix: Water
Analysis Batch: 512968

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.29		ug/L		93	56 - 135	5	26
cis-1,2-Dichloroethene	1.0	U	10.0	10.5		ug/L		105	66 - 128	2	14
Tetrachloroethene	0.69	J	10.0	10.3		ug/L		96	62 - 131	10	20
trans-1,2-Dichloroethene	1.0	U	10.0	11.0		ug/L		110	56 - 136	1	15
Trichloroethene	1.0	U	10.0	9.69		ug/L		97	61 - 124	6	15
Vinyl chloride	1.0	U	10.0	7.94		ug/L		79	43 - 157	4	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*101*		*62 - 137*
4-Bromofluorobenzene (Surr)	*101*		*56 - 136*
Toluene-d8 (Surr)	*102*		*78 - 122*
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Lab Sample ID: 240-159554-H-1 MS
Matrix: Water
Analysis Batch: 512968

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,1-Dichloroethene	1.0	U	10.0	8.82		ug/L		88	56 - 135		
cis-1,2-Dichloroethene	1.0	U	10.0	10.3		ug/L		103	66 - 128		
Tetrachloroethene	0.69	J	10.0	9.36		ug/L		87	62 - 131		
trans-1,2-Dichloroethene	1.0	U	10.0	10.9		ug/L		109	56 - 136		
Trichloroethene	1.0	U	10.0	9.16		ug/L		92	61 - 124		
Vinyl chloride	1.0	U	10.0	8.27		ug/L		83	43 - 157		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*107*		*62 - 137*
4-Bromofluorobenzene (Surr)	*101*		*56 - 136*
Toluene-d8 (Surr)	*102*		*78 - 122*
Dibromofluoromethane (Surr)	*98*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512585/5
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/11/21 19:04	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/11/21 19:04*	*1*

Lab Sample ID: LCS 240-512585/4
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	9.86		ug/L		99	80 - 122		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*

Lab Sample ID: 240-159418-H-2 MS
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U F1	10.0	11.1		ug/L		111	51 - 153		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159418-P-2 MSD
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.2		ug/L		102	51 - 153	8	16

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159518-1

GC/MS VOA

Analysis Batch: 512585

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159518-2	MW-130S_110421	Total/NA	Water	8260B SIM	
MB 240-512585/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512585/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159418-H-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159418-P-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 512819

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159518-1	TRIP BLANK_54	Total/NA	Water	8260B	
240-159518-2	MW-130S_110421	Total/NA	Water	8260B	
MB 240-512819/7	Method Blank	Total/NA	Water	8260B	
LCS 240-512819/4	Lab Control Sample	Total/NA	Water	8260B	
240-159546-H-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	
240-159546-K-2 MS	Matrix Spike	Total/NA	Water	8260B	

Analysis Batch: 512968

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159518-2	MW-130S_110421	Total/NA	Water	8260B	
MB 240-512968/7	Method Blank	Total/NA	Water	8260B	
LCS 240-512968/4	Lab Control Sample	Total/NA	Water	8260B	
240-159554-E-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	
240-159554-H-1 MS	Matrix Spike	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159518-1

Client Sample ID: TRIP BLANK_54

Lab Sample ID: 240-159518-1

Date Collected: 11/04/21 00:00

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512819	11/13/21 17:57	LEE	TAL CAN

Client Sample ID: MW-130S_110421

Lab Sample ID: 240-159518-2

Date Collected: 11/04/21 13:00

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512819	11/13/21 18:19	LEE	TAL CAN
Total/NA	Analysis	8260B		1	512968	11/15/21 13:17	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512585	11/12/21 02:38	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159518-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Sam Hindle		
Project Name: Ford LTP Off-Site	COURIER: CHRISTINA WEAVER		
Project Number: 30080642.402.04	Method of Shipment/Carrier:		
PO # 30080642.402.04	Shipping/Tracking No:		

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below: 10 day ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day

Analyses

Sample Identification	Sample Date	Sample Time	Matrix: Air	Matrix: Aqueous	Matrix: Sediment	Matrix: Solid	Matrix: Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_54	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-130S_110421	11/4/21	13:50		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159518 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
SH [signature]	Arcadis	11/4/21 19:11	NOVI COLD STORAGE	11/4/21 / 18:11	ARCADIS
[signature]	ARCADIS	11/5/21 / 1435	[signature]	~~11/5~~ ETA	11/5/21 1435
[signature]	ETA	11/5/21 1449	Received in Laboratory by: M.A.A.	ETA	11/6/21 8:00

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 159518

Client ARCADIS Site Name

Cooler Received on 11/6/21 Opened on 11/6/21

Cooler unpacked by: Matthew Surma

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.2 °C Corrected Cooler Temp. 0.3 °C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
& Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No	(NA) pH Strip Lot# HC157842
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 0104201G	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present?	Yes	(No)

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.

Sample(s) were received in a broken container.

Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.

Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

DATA VERIFICATION REPORT

November 22, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159518-1
Sample date: 2021-11-04
Report received by CADENA: 2021-11-22
Initial Data Verification completed by CADENA: 2021-11-22
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159518-1

		Sample Name:	TRIP BLANK_54				MW-130S_110421			
		Lab Sample ID:	2401595181				2401595182			
		Sample Date:	11/4/2021				11/4/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	2.3	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

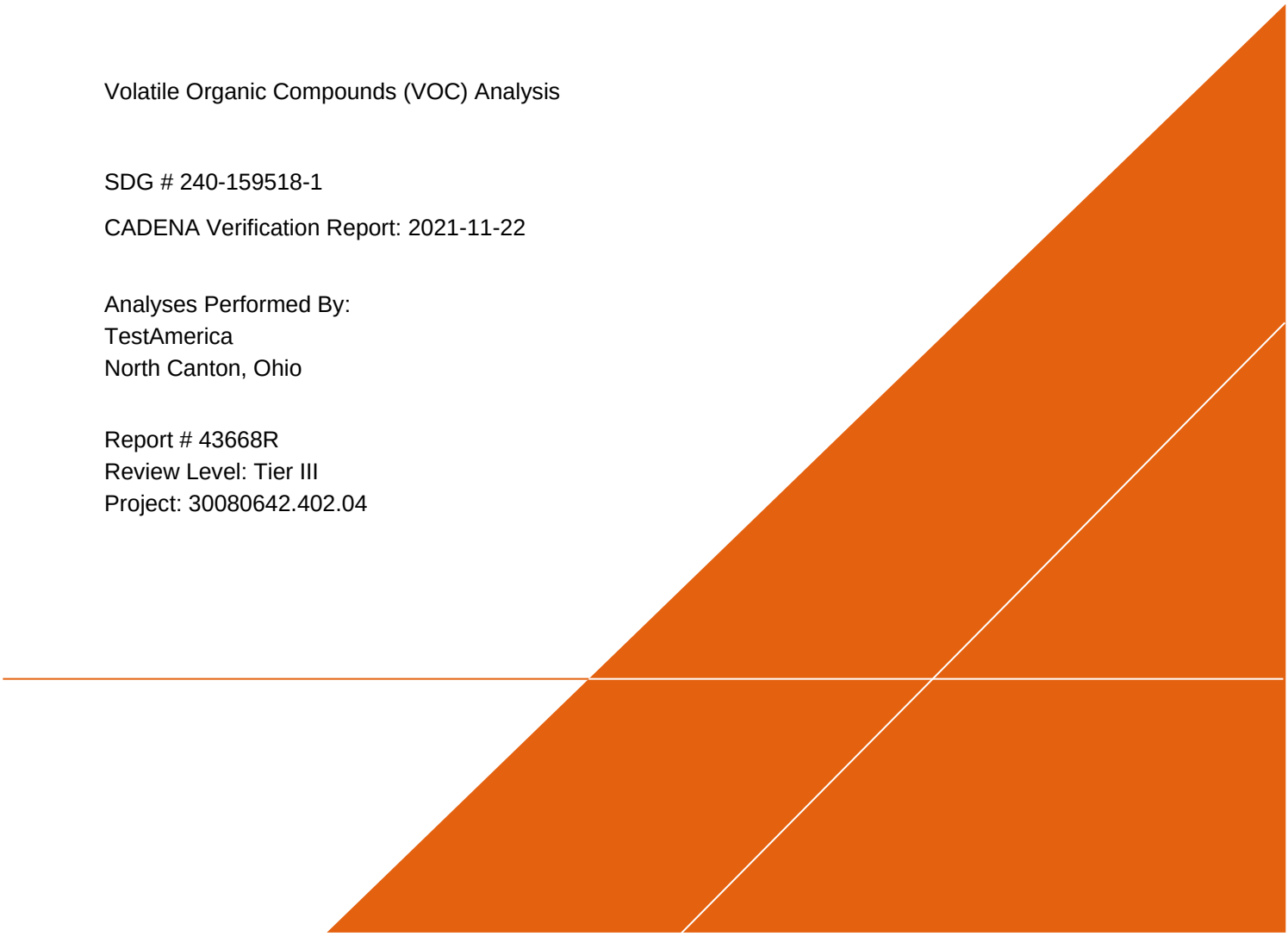
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159518-1

CADENA Verification Report: 2021-11-22

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43668R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159518-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_54	240-159518-1	Water	11/04/21		X	
MW-130S_110421	240-159518-2	Water	11/04/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Compound	Criteria
TRIP BLANK_54	Continuous Calibration Verification %D	Vinyl chloride	-21.2%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	

Initial/Continuing	Criteria	Sample Result	Qualification
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 09, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 09, 2021

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Sam Hinkle	TAT if different from below: ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client
Project Name: Ford LTP Off-Site	COURIER: CHRISTINA WEAVER	10 day		Lab sampling
Project Number: 30080642.402.04	Method of Shipment/Carrier:			Job/SDG No:
PO # 30080642.402.04	Shipping/Tracking No:			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_54	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-130S_110421	11/4/21	13:50		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159518 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by: SH	Arcadis	11/4/21 13:11	NOVI COLD STORAGE	11/4/21 / 18:11 →	ARCADIS
Relinquished by:	Company: ARCADIS	Date/Time: 11/5/21 / 1435	Received by:	Company: ETA	Date/Time: 11/5/21 1435
Relinquished by:	Company: ETA	Date/Time: 11/5/21 1449	Received in Laboratory by: M.A.	Company: ETA	Date/Time: 11/6/21 8:00

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Client Sample ID: TRIP BLANK_54
Lab Sample ID: 240-159518-1
Date Collected: 11/04/21 00:00
Matrix: Water
Date Received: 11/06/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 17:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 17:57	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 17:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 17:57	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 17:57	1
Vinyl chloride	1.0	~~U~~ UJ	1.0	0.45	ug/L			11/13/21 17:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*127*		*62 - 137*		*11/13/21 17:57*	*1*
4-Bromofluorobenzene (Surr)	*66*		*56 - 136*		*11/13/21 17:57*	*1*
Toluene-d8 (Surr)	*86*		*78 - 122*		*11/13/21 17:57*	*1*
Dibromofluoromethane (Surr)	*110*		*73 - 120*		*11/13/21 17:57*	*1*

Client Sample ID: MW-130S_110421
Lab Sample ID: 240-159518-2
Date Collected: 11/04/21 13:00
Matrix: Water
Date Received: 11/06/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 02:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*11/12/21 02:38*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 18:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 18:19	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 18:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 18:19	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 18:19	1
Vinyl chloride	**2.3**		1.0	0.45	ug/L			11/15/21 13:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*125*		*62 - 137*		*11/13/21 18:19*	*1*
1,2-Dichloroethane-d4 (Surr)	*121*		*62 - 137*		*11/15/21 13:17*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/13/21 18:19*	*1*
4-Bromofluorobenzene (Surr)	*69*		*56 - 136*		*11/15/21 13:17*	*1*
Toluene-d8 (Surr)	*87*		*78 - 122*		*11/13/21 18:19*	*1*
Toluene-d8 (Surr)	*91*		*78 - 122*		*11/15/21 13:17*	*1*
Dibromofluoromethane (Surr)	*106*		*73 - 120*		*11/13/21 18:19*	*1*
Dibromofluoromethane (Surr)	*108*		*73 - 120*		*11/15/21 13:17*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159715-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/24/2021 8:27:09 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159715-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159715-1

Job ID: 240-159715-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159715-1

Comments
No additional comments.

Receipt
The samples were received on 11/10/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 0.7º C and 0.8º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159715-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159715-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159715-1	TRIP BLANK_89	Water	11/08/21 00:00	11/10/21 08:00
240-159715-2	MW-164S_110821	Water	11/08/21 10:15	11/10/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159715-1

Client Sample ID: TRIP BLANK_89 — Lab Sample ID: 240-159715-1

No Detections.

Client Sample ID: MW-164S_110821 — Lab Sample ID: 240-159715-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159715-1

Client Sample ID: TRIP BLANK_89

Date Collected: 11/08/21 00:00
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159715-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 16:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 16:50	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 16:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 16:50	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 16:50	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 16:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*113*		*62 - 137*		*11/17/21 16:50*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/17/21 16:50*	*1*
Toluene-d8 (Surr)	*85*		*78 - 122*		*11/17/21 16:50*	*1*
Dibromofluoromethane (Surr)	*97*		*73 - 120*		*11/17/21 16:50*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159715-1

Client Sample ID: MW-164S_110821
Date Collected: 11/08/21 10:15
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159715-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 02:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*		*11/18/21 02:22*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 17:12	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 17:12	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 17:12	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 17:12	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 17:12	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 17:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*62 - 137*		*11/17/21 17:12*	*1*
4-Bromofluorobenzene (Surr)	*68*		*56 - 136*		*11/17/21 17:12*	*1*
Toluene-d8 (Surr)	*86*		*78 - 122*		*11/17/21 17:12*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/17/21 17:12*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159715-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159715-1	TRIP BLANK_89	113	70	85	97
240-159715-2	MW-164S_110821	116	68	86	98
240-159724-A-2 MS	Matrix Spike	96	99	103	84
240-159724-C-2 MSD	Matrix Spike Duplicate	97	97	106	86
LCS 240-513417/4	Lab Control Sample	93	97	98	84
MB 240-513417/7	Method Blank	105	76	89	91

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159636-H-2 MS	Matrix Spike	77
240-159636-N-2 MSD	Matrix Spike Duplicate	77
240-159715-2	MW-164S_110821	78
LCS 240-513479/4	Lab Control Sample	78
MB 240-513479/5	Method Blank	77

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513417/7
Matrix: Water
Analysis Batch: 513417

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 13:33	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 13:33	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 13:33	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 13:33	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 13:33	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 13:33	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/17/21 13:33*	*1*
4-Bromofluorobenzene (Surr)	*76*		*56 - 136*		*11/17/21 13:33*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/17/21 13:33*	*1*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*11/17/21 13:33*	*1*

Lab Sample ID: LCS 240-513417/4
Matrix: Water
Analysis Batch: 513417

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.24		ug/L		92	63 - 134
cis-1,2-Dichloroethene	10.0	9.72		ug/L		97	77 - 123
Tetrachloroethene	10.0	9.53		ug/L		95	76 - 123
trans-1,2-Dichloroethene	10.0	10.1		ug/L		101	75 - 124
Trichloroethene	10.0	8.80		ug/L		88	70 - 122
Vinyl chloride	10.0	11.6		ug/L		116	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*97*		*56 - 136*
Toluene-d8 (Surr)	*98*		*78 - 122*
Dibromofluoromethane (Surr)	*84*		*73 - 120*

Lab Sample ID: 240-159724-A-2 MS
Matrix: Water
Analysis Batch: 513417

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	8.39		ug/L		84	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	8.85		ug/L		88	66 - 128
Tetrachloroethene	1.0	U	10.0	8.96		ug/L		90	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.58		ug/L		96	56 - 136
Trichloroethene	1.0	U	10.0	7.89		ug/L		79	61 - 124
Vinyl chloride	2.8		10.0	14.2		ug/L		114	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*
4-Bromofluorobenzene (Surr)	*99*		*56 - 136*
Toluene-d8 (Surr)	*103*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159724-A-2 MS
Matrix: Water
Analysis Batch: 513417

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*84*		*73 - 120*

Lab Sample ID: 240-159724-C-2 MSD
Matrix: Water
Analysis Batch: 513417

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	7.80		ug/L		78	56 - 135	7	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.45		ug/L		95	66 - 128	7	14
Tetrachloroethene	1.0	U	10.0	9.27		ug/L		93	62 - 131	3	20
trans-1,2-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	56 - 136	8	15
Trichloroethene	1.0	U	10.0	8.32		ug/L		83	61 - 124	5	15
Vinyl chloride	2.8		10.0	15.8		ug/L		130	43 - 157	11	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*62 - 137*
4-Bromofluorobenzene (Surr)	*97*		*56 - 136*
Toluene-d8 (Surr)	*106*		*78 - 122*
Dibromofluoromethane (Surr)	*86*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513479/5
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 17:41	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*		*11/17/21 17:41*	*1*

Lab Sample ID: LCS 240-513479/4
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	11.9		ug/L		119	80 - 122		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*

Lab Sample ID: 240-159636-H-2 MS
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153		

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

Lab Sample ID: 240-159636-N-2 MSD
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153	0	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159715-1

GC/MS VOA

Analysis Batch: 513417

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159715-1	TRIP BLANK_89	Total/NA	Water	8260B	
240-159715-2	MW-164S_110821	Total/NA	Water	8260B	
MB 240-513417/7	Method Blank	Total/NA	Water	8260B	
LCS 240-513417/4	Lab Control Sample	Total/NA	Water	8260B	
240-159724-A-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159724-C-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 513479

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159715-2	MW-164S_110821	Total/NA	Water	8260B SIM	
MB 240-513479/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513479/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159636-H-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159636-N-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159715-1

Client Sample ID: TRIP BLANK_89

Lab Sample ID: 240-159715-1

Date Collected: 11/08/21 00:00

Matrix: Water

Date Received: 11/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513417	11/17/21 16:50	LEE	TAL CAN

Client Sample ID: MW-164S_110821

Lab Sample ID: 240-159715-2

Date Collected: 11/08/21 10:15

Matrix: Water

Date Received: 11/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513417	11/17/21 17:12	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513479	11/18/21 02:22	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159715-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN
190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Andrew Barth	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day — 10 day		Walk-in client: Lab sampling:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30080642.402.04	Shipping/Tracking No:			
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_89	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1645_110821	11/3/21	1015		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159715 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalla@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: [signature]	Arcadis	11/8/21 1630	Received by: Novi Cold Storage	Arcadis	11/8/21 1630
Relinquished by: [signature]	ARCADIS	11/9/21 1040	Received by: [signature]	ETA	11/9/21 1040
Relinquished by: [signature]	ETA	11/9/21 1055	Received in Laboratory by: Mandolyn Black	ETN	11-10-21 8:00

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159715**
Canton Facility

Client Arcadis Site Name

Cooler Received on 11-10-21 Opened on 11-10-21

Cooler unpacked by: Marilyn Beaver

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: ~~Bubble Wrap~~ Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity_____	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC157842
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #_____	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

No TB on SIM per Corrected COC. ame 11-10-21

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

Login # : 159715

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form				
Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
(TA) Client Box Other	(IR-14) IR-15	0.6	0.7	(Wet Ice) Blue Ice Dry Ice Water None
(TA) Client Box Other	(IR-14) IR-15	0.7	0.8	(Wet Ice) Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice

DATA VERIFICATION REPORT

November 25, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159715-1
Sample date: 2021-11-08
Report received by CADENA: 2021-11-24
Initial Data Verification completed by CADENA: 2021-11-25
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159715-1

		Sample Name:	TRIP BLANK_89				MW-164S_110821			
		Lab Sample ID:	2401597151				2401597152			
		Sample Date:	11/8/2021				11/8/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

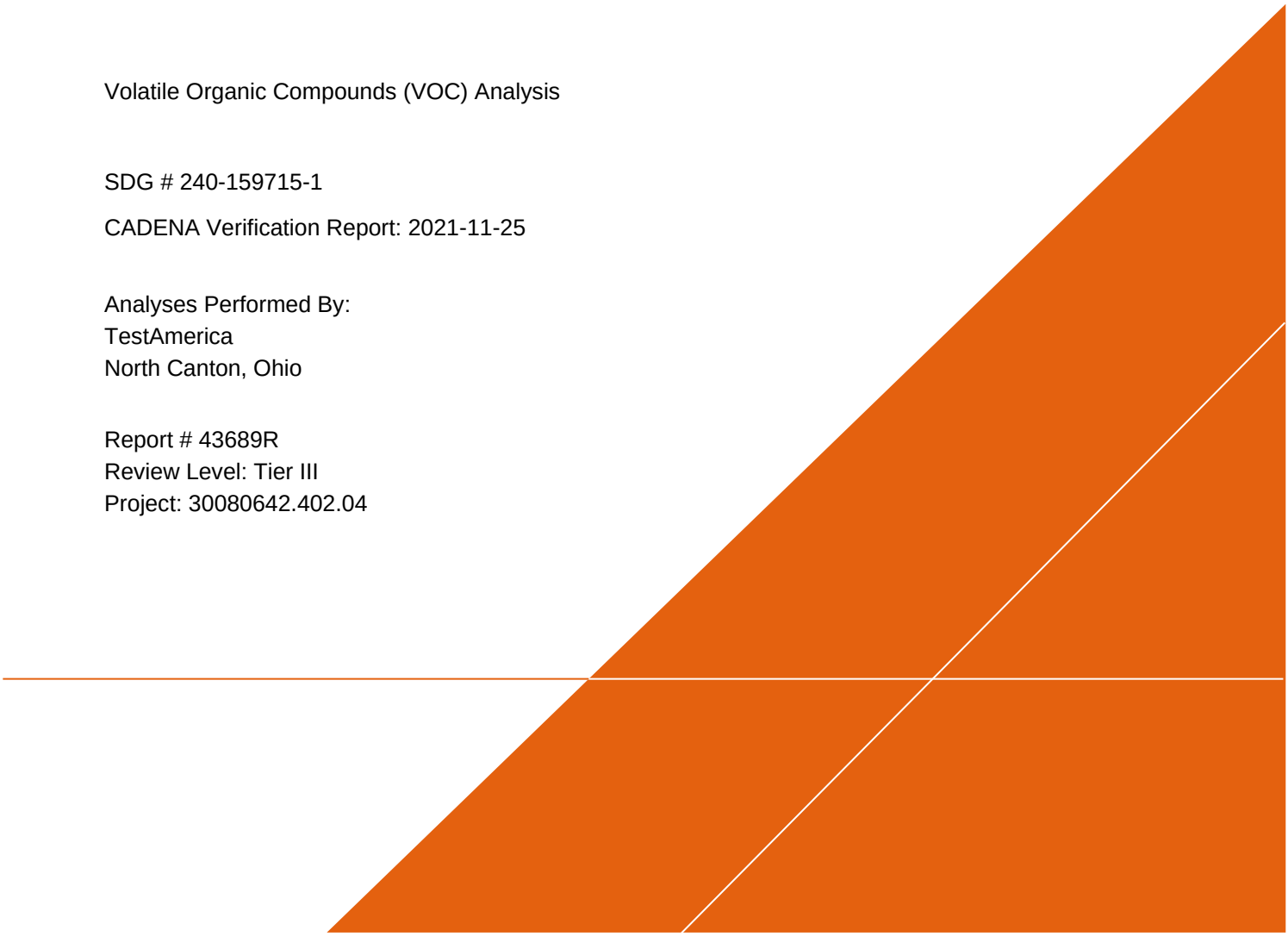
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159715-1

CADENA Verification Report: 2021-11-25

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43689R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159715-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_89	240-159715-1	Water	11/08/21		X	
MW-164S_110821	240-159715-2	Water	11/08/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 10, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 14, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Andrew Barth	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client: Lab sampling:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30080642.402.04	Shipping/Tracking No:			
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_89	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1645_110821	11/8/21	1015		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159715 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalla@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	11/8/21 1630	Novi Cold Storage	Arcadis	11/8/21 1630
[signature]	ARCADIS	11/9/21 1040	[signature]	ETA	11/9/21 1040
[signature]	ETA	11/9/21 1055	Mandaly Black	ETA	11-10-21 8:00

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11/24/2021

Client Sample ID: TRIP BLANK_89
Lab Sample ID: 240-159715-1
Date Collected: 11/08/21 00:00
Matrix: Water
Date Received: 11/10/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 16:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 16:50	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 16:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 16:50	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 16:50	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 16:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*113*		*62 - 137*		*11/17/21 16:50*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/17/21 16:50*	*1*
Toluene-d8 (Surr)	*85*		*78 - 122*		*11/17/21 16:50*	*1*
Dibromofluoromethane (Surr)	*97*		*73 - 120*		*11/17/21 16:50*	*1*

Client Sample ID: MW-164S_110821
Lab Sample ID: 240-159715-2
Date Collected: 11/08/21 10:15
Matrix: Water
Date Received: 11/10/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 02:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*		*11/18/21 02:22*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 17:12	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 17:12	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 17:12	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 17:12	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 17:12	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 17:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*62 - 137*		*11/17/21 17:12*	*1*
4-Bromofluorobenzene (Surr)	*68*		*56 - 136*		*11/17/21 17:12*	*1*
Toluene-d8 (Surr)	*86*		*78 - 122*		*11/17/21 17:12*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/17/21 17:12*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159831-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/26/2021 7:54:55 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159831-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159831-1

Job ID: 240-159831-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159831-1

Comments
No additional comments.

Receipt
The samples were received on 11/11/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 4.6º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159831-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159831-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159831-1	TRIP BLANK_70	Water	11/09/21 00:00	11/11/21 08:00
240-159831-2	MW-153S_110921	Water	11/09/21 12:20	11/11/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159831-1

Client Sample ID: TRIP BLANK_70 — Lab Sample ID: 240-159831-1

No Detections.

Client Sample ID: MW-153S_110921 — Lab Sample ID: 240-159831-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159831-1

Client Sample ID: TRIP BLANK_70
Date Collected: 11/09/21 00:00
Date Received: 11/11/21 08:00

Lab Sample ID: 240-159831-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 15:56	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 15:56	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 15:56	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 15:56	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 15:56	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 15:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*		*11/18/21 15:56*	*1*
4-Bromofluorobenzene (Surr)	*83*		*56 - 136*		*11/18/21 15:56*	*1*
Toluene-d8 (Surr)	*92*		*78 - 122*		*11/18/21 15:56*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/18/21 15:56*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159831-1

Client Sample ID: MW-153S_110921
Date Collected: 11/09/21 12:20
Date Received: 11/11/21 08:00

Lab Sample ID: 240-159831-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/13/21 00:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*		*11/13/21 00:44*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 18:28	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 18:28	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 18:28	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 18:28	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 18:28	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 18:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/18/21 18:28*	*1*
4-Bromofluorobenzene (Surr)	*83*		*56 - 136*		*11/18/21 18:28*	*1*
Toluene-d8 (Surr)	*92*		*78 - 122*		*11/18/21 18:28*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/18/21 18:28*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159831-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159831-1	TRIP BLANK_70	90	83	92	96
240-159831-2	MW-153S_110921	93	83	92	100
240-159848-E-3 MS	Matrix Spike	89	93	92	95
240-159848-E-3 MSD	Matrix Spike Duplicate	86	95	94	94
LCS 240-513621/5	Lab Control Sample	87	90	95	94
MB 240-513621/8	Method Blank	90	84	93	99

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159541-G-2 MS	Matrix Spike	77
240-159541-M-2 MSD	Matrix Spike Duplicate	78
240-159831-2	MW-153S_110921	75
LCS 240-512785/4	Lab Control Sample	79
MB 240-512785/5	Method Blank	79

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513621/8
Matrix: Water
Analysis Batch: 513621

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 15:31	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 15:31	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 15:31	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 15:31	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 15:31	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 15:31	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*		*11/18/21 15:31*	*1*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*		*11/18/21 15:31*	*1*
Toluene-d8 (Surr)	*93*		*78 - 122*		*11/18/21 15:31*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/18/21 15:31*	*1*

Lab Sample ID: LCS 240-513621/5
Matrix: Water
Analysis Batch: 513621

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	26.8		ug/L		107	63 - 134
cis-1,2-Dichloroethene	25.0	24.6		ug/L		99	77 - 123
Tetrachloroethene	25.0	26.5		ug/L		106	76 - 123
trans-1,2-Dichloroethene	25.0	25.6		ug/L		102	75 - 124
Trichloroethene	25.0	25.5		ug/L		102	70 - 122
Vinyl chloride	25.0	20.1		ug/L		81	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*87*		*62 - 137*
4-Bromofluorobenzene (Surr)	*90*		*56 - 136*
Toluene-d8 (Surr)	*95*		*78 - 122*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: 240-159848-E-3 MS
Matrix: Water
Analysis Batch: 513621

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	2.0	U	50.0	52.2		ug/L		104	56 - 135
cis-1,2-Dichloroethene	2.0	U	50.0	52.0		ug/L		104	66 - 128
Tetrachloroethene	2.0	U	50.0	56.8		ug/L		114	62 - 131
trans-1,2-Dichloroethene	2.0	U	50.0	51.2		ug/L		102	56 - 136
Trichloroethene	2.0	U	50.0	51.9		ug/L		104	61 - 124
Vinyl chloride	2.0	U	50.0	41.8		ug/L		84	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*62 - 137*
4-Bromofluorobenzene (Surr)	*93*		*56 - 136*
Toluene-d8 (Surr)	*92*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159848-E-3 MS
Matrix: Water
Analysis Batch: 513621

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*95*		*73 - 120*

Lab Sample ID: 240-159848-E-3 MSD
Matrix: Water
Analysis Batch: 513621

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	2.0	U	50.0	49.7		ug/L		99	56 - 135	5	26
cis-1,2-Dichloroethene	2.0	U	50.0	48.6		ug/L		97	66 - 128	7	14
Tetrachloroethene	2.0	U	50.0	55.3		ug/L		111	62 - 131	3	20
trans-1,2-Dichloroethene	2.0	U	50.0	48.6		ug/L		97	56 - 136	5	15
Trichloroethene	2.0	U	50.0	49.9		ug/L		100	61 - 124	4	15
Vinyl chloride	2.0	U	50.0	38.6		ug/L		77	43 - 157	8	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*
4-Bromofluorobenzene (Surr)	*95*		*56 - 136*
Toluene-d8 (Surr)	*94*		*78 - 122*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512785/5
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 18:32	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*66 - 120*		*11/12/21 18:32*	*1*

Lab Sample ID: LCS 240-512785/4
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.7		ug/L		107	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*66 - 120*

Lab Sample ID: 240-159541-G-2 MS
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

Lab Sample ID: 240-159541-M-2 MSD
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.4		ug/L		104	51 - 153	2	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159831-1

GC/MS VOA

Analysis Batch: 512785

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159831-2	MW-153S_110921	Total/NA	Water	8260B SIM	
MB 240-512785/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512785/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159541-G-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159541-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513621

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159831-1	TRIP BLANK_70	Total/NA	Water	8260B	
240-159831-2	MW-153S_110921	Total/NA	Water	8260B	
MB 240-513621/8	Method Blank	Total/NA	Water	8260B	
LCS 240-513621/5	Lab Control Sample	Total/NA	Water	8260B	
240-159848-E-3 MS	Matrix Spike	Total/NA	Water	8260B	
240-159848-E-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159831-1

Client Sample ID: TRIP BLANK_70

Lab Sample ID: 240-159831-1

Date Collected: 11/09/21 00:00

Matrix: Water

Date Received: 11/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513621	11/18/21 15:56	SAM	TAL CAN

Client Sample ID: MW-153S_110921

Lab Sample ID: 240-159831-2

Date Collected: 11/09/21 12:20

Matrix: Water

Date Received: 11/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513621	11/18/21 18:28	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	512785	11/13/21 00:44	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159831-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Seth Turner	TAT if different from below		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:	10 day (✓) 3 weeks / 2 weeks / 1 week / 2 days / 1 day		Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_70	—	—		X						1							X	X	X	X	X	X	X	1 Trip Blank
MW-153S-110921	11/9/21	1220		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159831 Chain of Custody

Possible Hazard Identification: (✓) Non-Hazard ( ) Flammable ( ) Skin Irritant ( ) Poison B ( ) Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client (✓) Disposal By Lab ( ) Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E20363
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Seth Turner	Arcadis	11/9/21 1830	Novi cold storage	Arcadis	11/9/21 1330
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Arcadis	11/10/21 10:40		GTA	11/10/21 1040
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
	GTA	11/10/21 1045		ETA	11-11-21 800

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11/26/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159831**
Canton Facility

Client Arcadis Site Name

Cooler Received on 11-11-21 Opened on 11-11-21

Cooler unpacked by: Tammy Depp

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: ~~Bubble Wrap~~ Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 4.5 °C Corrected Cooler Temp. 4.6 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# HC157842
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 60358	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present?	Yes	(No)

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

NO SIM on TB per corrected COC. DWE 11/11/21

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.

Sample(s) were received in a broken container.

Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.

Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

DATA VERIFICATION REPORT

November 26, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159831-1
Sample date: 2021-11-09
Report received by CADENA: 2021-11-26
Initial Data Verification completed by CADENA: 2021-11-26
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159831-1

		Sample Name:	TRIP BLANK_70				MW-153S_110921			
		Lab Sample ID:	2401598311				2401598312			
		Sample Date:	11/9/2021				11/9/2021			
	Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC										
	OSW-8260B									
	1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	OSW-8260BBSim									
	1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

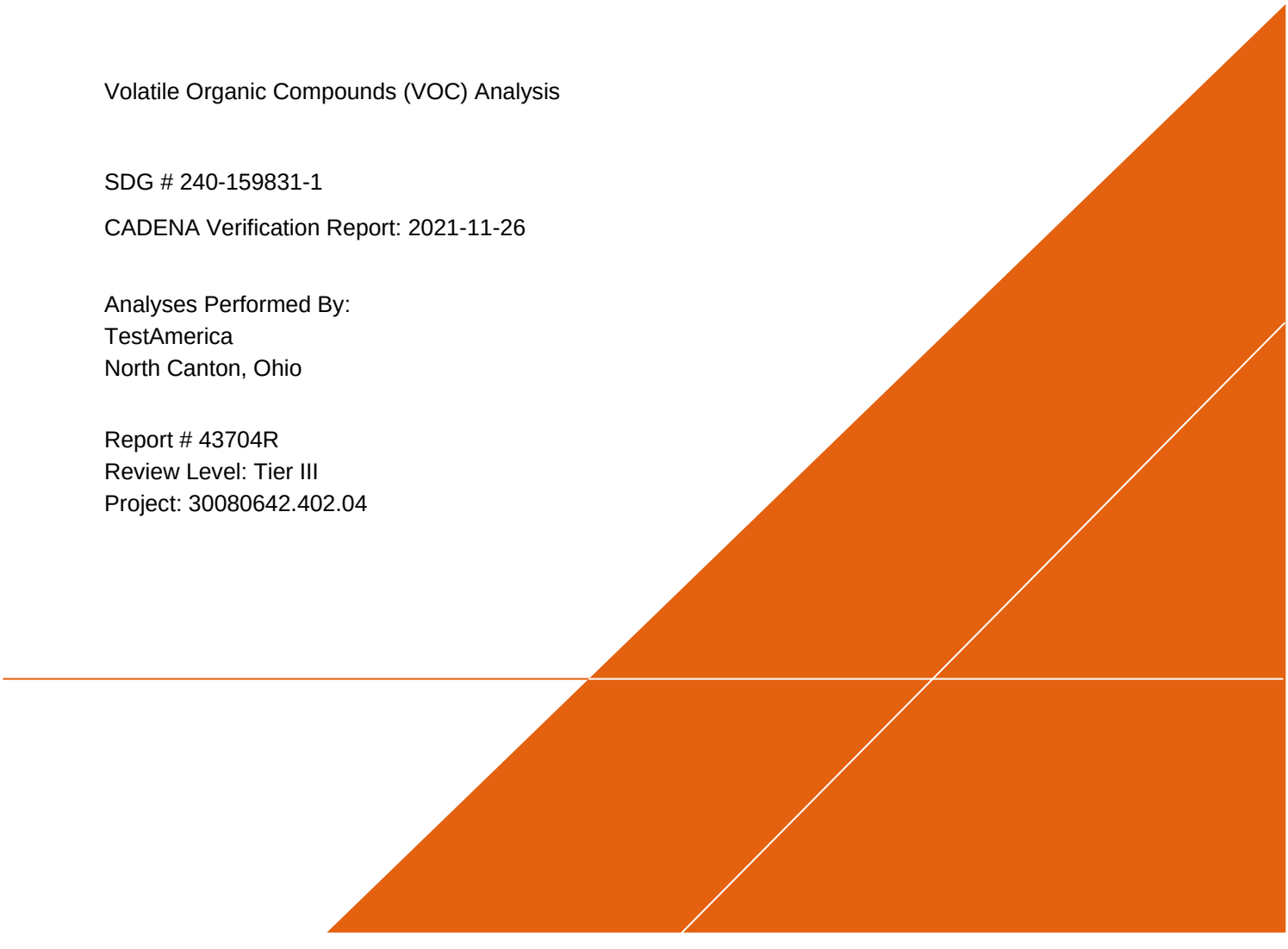
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159831-1

CADENA Verification Report: 2021-11-26

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43704R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159831-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_70	240-159831-1	Water	11/09/21		X	
MW-153S_110921	240-159831-2	Water	11/09/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 14, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 14, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 100

Chain of Custody Record

TestAmerica

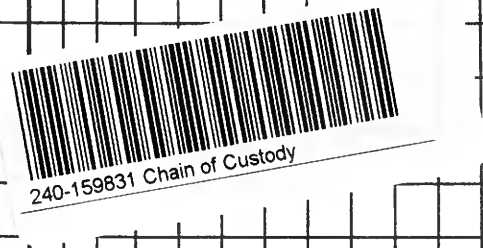
TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Seth Turner	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_70	—	—		X						1							X	X	X	X	X	X	X	1 Trip Blank
MW-153S-110921	11/9/21	1220		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM



Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company:	Date/Time:		Company:	Date/Time:
Relinquished by: Seth Turner	Arcadis	11/9/21 1830	Received by: Novi cold storage	Arcadis	11/9/21 1330
Relinquished by:	Arcadis	11/10/21 10:40	Received by:	GTA	11/10/21 1040
Relinquished by:	GTA	11/10/21 1045	Received in Laboratory by:	ETA	11-11-21 800

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Client Sample ID: TRIP BLANK_70
Lab Sample ID: 240-159831-1
Date Collected: 11/09/21 00:00
Matrix: Water
Date Received: 11/11/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 15:56	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 15:56	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 15:56	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 15:56	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 15:56	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 15:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*		*11/18/21 15:56*	*1*
4-Bromofluorobenzene (Surr)	*83*		*56 - 136*		*11/18/21 15:56*	*1*
Toluene-d8 (Surr)	*92*		*78 - 122*		*11/18/21 15:56*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/18/21 15:56*	*1*

Client Sample ID: MW-153S_110921
Lab Sample ID: 240-159831-2
Date Collected: 11/09/21 12:20
Matrix: Water
Date Received: 11/11/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/13/21 00:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*		*11/13/21 00:44*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 18:28	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 18:28	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 18:28	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 18:28	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 18:28	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 18:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/18/21 18:28*	*1*
4-Bromofluorobenzene (Surr)	*83*		*56 - 136*		*11/18/21 18:28*	*1*
Toluene-d8 (Surr)	*92*		*78 - 122*		*11/18/21 18:28*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/18/21 18:28*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159517-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/22/2021 7:56:19 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159517-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159517-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159517-1

Comments
No additional comments.

Receipt
The samples were received on 11/6/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.4º C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) for analytical batch 512819 exceeded control criteria for Vinyl Chloride. The samples associated with this CCV were non-detect for the affected analytes. In accordance with the laboratory SOP, a low level CCV at the reporting limit (labeled as an MRL) was analyzed and the affected compounds were detected; therefore the data has been reported. No further corrective action was required: TRIP BLANK_18 (240-159517-1) and MW-165S_110421 (240-159517-2).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159517-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159517-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159517-1	TRIP BLANK_18	Water	11/04/21 00:00	11/06/21 08:00
240-159517-2	MW-165S_110421	Water	11/04/21 13:31	11/06/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159517-1

Client Sample ID: TRIP BLANK_18 — Lab Sample ID: 240-159517-1

No Detections.

Client Sample ID: MW-165S_110421 — Lab Sample ID: 240-159517-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159517-1

Client Sample ID: TRIP BLANK_18

Date Collected: 11/04/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159517-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 17:13	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 17:13	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 17:13	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 17:13	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 17:13	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 17:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*123*		*62 - 137*		*11/13/21 17:13*	*1*
4-Bromofluorobenzene (Surr)	*69*		*56 - 136*		*11/13/21 17:13*	*1*
Toluene-d8 (Surr)	*86*		*78 - 122*		*11/13/21 17:13*	*1*
Dibromofluoromethane (Surr)	*109*		*73 - 120*		*11/13/21 17:13*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159517-1

Client Sample ID: MW-165S_110421
Date Collected: 11/04/21 13:31
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159517-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 02:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*66 - 120*		*11/12/21 02:13*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 17:35	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 17:35	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 17:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 17:35	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 17:35	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 17:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*127*		*62 - 137*		*11/13/21 17:35*	*1*
4-Bromofluorobenzene (Surr)	*69*		*56 - 136*		*11/13/21 17:35*	*1*
Toluene-d8 (Surr)	*85*		*78 - 122*		*11/13/21 17:35*	*1*
Dibromofluoromethane (Surr)	*113*		*73 - 120*		*11/13/21 17:35*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159517-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159517-1	TRIP BLANK_18	123	69	86	109
240-159517-2	MW-165S_110421	127	69	85	113
240-159546-H-2 MSD	Matrix Spike Duplicate	102	98	101	91
240-159546-K-2 MS	Matrix Spike	105	96	102	93
LCS 240-512819/4	Lab Control Sample	100	99	100	91
MB 240-512819/7	Method Blank	119	75	89	102

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159418-H-2 MS	Matrix Spike	82
240-159418-P-2 MSD	Matrix Spike Duplicate	83
240-159517-2	MW-165S_110421	80
LCS 240-512585/4	Lab Control Sample	81
MB 240-512585/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512819/7
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 13:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 13:57	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 13:57	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:57	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 13:57	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*62 - 137*		*11/13/21 13:57*	*1*
4-Bromofluorobenzene (Surr)	*75*		*56 - 136*		*11/13/21 13:57*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/13/21 13:57*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/13/21 13:57*	*1*

Lab Sample ID: LCS 240-512819/4
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.01		ug/L		90	63 - 134
cis-1,2-Dichloroethene	10.0	10.7		ug/L		107	77 - 123
Tetrachloroethene	10.0	9.49		ug/L		95	76 - 123
trans-1,2-Dichloroethene	10.0	11.0		ug/L		110	75 - 124
Trichloroethene	10.0	9.48		ug/L		95	70 - 122
Vinyl chloride	10.0	8.38		ug/L		84	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*99*		*56 - 136*
Toluene-d8 (Surr)	*100*		*78 - 122*
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Lab Sample ID: 240-159546-H-2 MSD
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	8.50		ug/L		85	56 - 135	11	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.62		ug/L		96	66 - 128	1	14
Tetrachloroethene	1.0	U	10.0	8.67		ug/L		87	62 - 131	16	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.76		ug/L		98	56 - 136	3	15
Trichloroethene	1.0	U	10.0	8.44		ug/L		84	61 - 124	9	15
Vinyl chloride	1.0	U	10.0	7.09		ug/L		71	43 - 157	3	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*
4-Bromofluorobenzene (Surr)	*98*		*56 - 136*
Toluene-d8 (Surr)	*101*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159546-H-2 MSD
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Lab Sample ID: 240-159546-K-2 MS
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	7.61		ug/L		76	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.48		ug/L		95	66 - 128
Tetrachloroethene	1.0	U	10.0	7.41		ug/L		74	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.49		ug/L		95	56 - 136
Trichloroethene	1.0	U	10.0	7.75		ug/L		77	61 - 124
Vinyl chloride	1.0	U	10.0	7.30		ug/L		73	43 - 157

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*
4-Bromofluorobenzene (Surr)	*96*		*56 - 136*
Toluene-d8 (Surr)	*102*		*78 - 122*
Dibromofluoromethane (Surr)	*93*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512585/5
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/11/21 19:04	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/11/21 19:04*	*1*

Lab Sample ID: LCS 240-512585/4
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.86		ug/L		99	80 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*

Lab Sample ID: 240-159418-H-2 MS
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	11.1		ug/L		111	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159418-P-2 MSD
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.2		ug/L		102	51 - 153	8	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159517-1

GC/MS VOA

Analysis Batch: 512585

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159517-2	MW-165S_110421	Total/NA	Water	8260B SIM	
MB 240-512585/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512585/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159418-H-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159418-P-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 512819

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159517-1	TRIP BLANK_18	Total/NA	Water	8260B	
240-159517-2	MW-165S_110421	Total/NA	Water	8260B	
MB 240-512819/7	Method Blank	Total/NA	Water	8260B	
LCS 240-512819/4	Lab Control Sample	Total/NA	Water	8260B	
240-159546-H-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	
240-159546-K-2 MS	Matrix Spike	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159517-1

Client Sample ID: TRIP BLANK_18

Lab Sample ID: 240-159517-1

Date Collected: 11/04/21 00:00

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512819	11/13/21 17:13	LEE	TAL CAN

Client Sample ID: MW-165S_110421

Lab Sample ID: 240-159517-2

Date Collected: 11/04/21 13:31

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512819	11/13/21 17:35	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512585	11/12/21 02:13	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159517-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No: 1 of 1 COCs
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day	For lab use only: Walk-in client; Lab sampling; Job/SDG No:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30080642.402.04	Shipping/Tracking No:		
PO # 30080642.402.04			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_18	---	---		X						1					N	G	X	X	X	X	X	X	X (2)	1 Trip Blank
MW-1655_110421	11/04/21	1331		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159517 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	11/04/21 1606	Novi cold storage	Arcadis	11/04/21 1606
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	ARCADIS	11/5/21 1435	Jeri Hall	ETA	11/5/21 1435
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
Jeri Hall	ETA	11/5/21 1448	M. A.	ETA	11/6/21 8:00

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11/22/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 154517**
Canton Facility

Client ARCADIS Site Name _____ Cooler unpacked by: Matthew Surma

Cooler Received on 11/6/21 Opened on 11/6/21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.3 °C Corrected Cooler Temp. 0.4 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# **HC157842**
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 01042016 (Yes) No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page — Samples processed by:

No SIM on TB per corrected COC. CME 11/10/21

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

WI-NC-099

DATA VERIFICATION REPORT

November 22, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159517-1
Sample date: 2021-11-04
Report received by CADENA: 2021-11-22
Initial Data Verification completed by CADENA: 2021-11-22
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159517-1

		Sample Name:	TRIP BLANK_18				MW-165S_110421			
		Lab Sample ID:	2401595171				2401595172			
		Sample Date:	11/4/2021				11/4/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

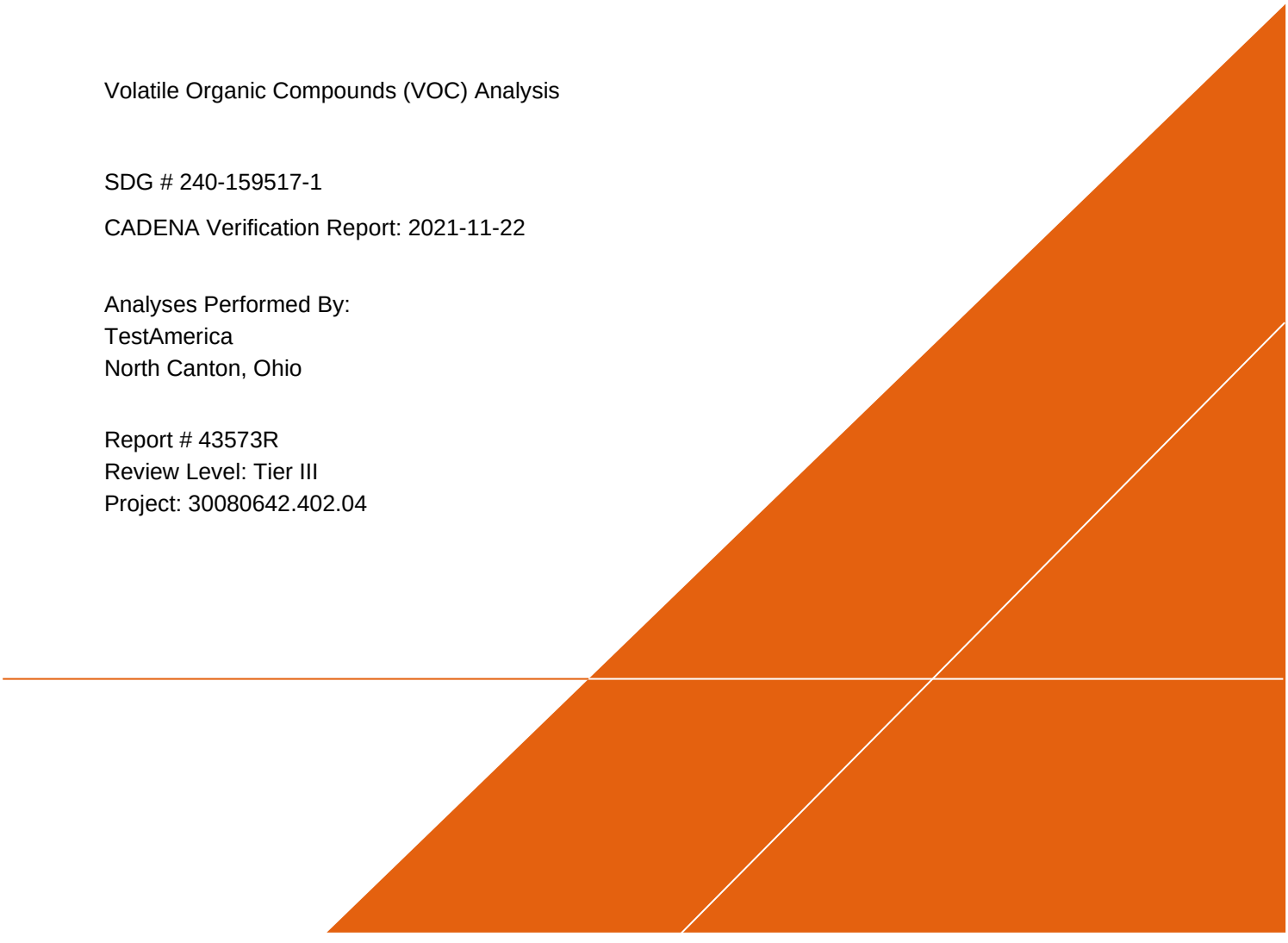
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159517-1

CADENA Verification Report: 2021-11-22

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43573R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159517-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_18	240-159517-1	Water	11/04/21		X	
MW-165S_110421	240-159517-2	Water	11/04/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Compound	Criteria
TRIP BLANK_43 MW-91S_110421	Continuous Calibration Verification %D	Vinyl chloride	-21.2%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	

Initial/Continuing	Criteria	Sample Result	Qualification
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE:

DATE: December 07, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 8, 2021

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact

Company Name: Arcadis

Address: 28550 Cabot Drive, Suite 500

City/State/Zip: Novi, MI, 48377

Phone: 248-994-2240

Project Name: Ford LTP Off-Site

Project Number: 30080642.402.04

PO # 30080642.402.04

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

Client Project Manager: Kris Hinskey

Telephone: 248-994-2240

Email: kristoffer.hinskey@arcadis.com

Sampler Name: Gary Schafer

Method of Shipment/Carrier:

Shipping/Tracking No:

Site Contact: Julia McClafferty

Telephone: 734-644-5131

Lab Contact: Mike DelMonico

Telephone: 330-497-9396

COC No:

1 of 1 COCs

Analysis Turnaround Time

TAT if different from below

10 day

☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_18	---	---		X						1					N	G	X	X	X	X	X	X	X (2)	1 Trip Blank
MW-1655_110421	11/04/21	1331		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159517 Chain of Custody

Possible Hazard Identification

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	11/04/21 1606	Novi cold storage	Arcadis	11/04/21 1606
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	ARCADIS	11/5/21 1435	Jeri Hall	ETA	11/5/21 1435
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
Jeri Hall	ETA	11/5/21 1448	M. A.	ETA	11/6/21 8:00

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11/22/2021

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159517-1

Client Sample ID: TRIP BLANK_18
Date Collected: 11/04/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159517-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 17:13	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 17:13	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 17:13	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 17:13	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 17:13	1
Vinyl chloride	1.0	U UJ	1.0	0.45	ug/L			11/13/21 17:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*123*		*62 - 137*		*11/13/21 17:13*	*1*
4-Bromofluorobenzene (Surr)	*69*		*56 - 136*		*11/13/21 17:13*	*1*
Toluene-d8 (Surr)	*86*		*78 - 122*		*11/13/21 17:13*	*1*
Dibromofluoromethane (Surr)	*109*		*73 - 120*		*11/13/21 17:13*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159517-1

Client Sample ID: MW-165S_110421
Date Collected: 11/04/21 13:31
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159517-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 02:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*66 - 120*		*11/12/21 02:13*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 17:35	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 17:35	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 17:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 17:35	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 17:35	1
Vinyl chloride	1.0	U UJ	1.0	0.45	ug/L			11/13/21 17:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*127*		*62 - 137*		*11/13/21 17:35*	*1*
4-Bromofluorobenzene (Surr)	*69*		*56 - 136*		*11/13/21 17:35*	*1*
Toluene-d8 (Surr)	*85*		*78 - 122*		*11/13/21 17:35*	*1*
Dibromofluoromethane (Surr)	*113*		*73 - 120*		*11/13/21 17:35*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159723-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/24/2021 8:30:39 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159723-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159723-1

Job ID: 240-159723-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159723-1

Comments
No additional comments.

Receipt
The samples were received on 11/10/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 0.7º C and 0.8º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159723-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159723-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159723-1	TRIP BLANK_88	Water	11/08/21 00:00	11/10/21 08:00
240-159723-2	MW-154S_110821	Water	11/08/21 11:33	11/10/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159723-1

Client Sample ID: TRIP BLANK_88 — Lab Sample ID: 240-159723-1

No Detections.

Client Sample ID: MW-154S_110821 — Lab Sample ID: 240-159723-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159723-1

Client Sample ID: TRIP BLANK_88

Date Collected: 11/08/21 00:00
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159723-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 19:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 19:44	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 19:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 19:44	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 19:44	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 19:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*62 - 137*		*11/17/21 19:44*	*1*
4-Bromofluorobenzene (Surr)	*66*		*56 - 136*		*11/17/21 19:44*	*1*
Toluene-d8 (Surr)	*85*		*78 - 122*		*11/17/21 19:44*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/17/21 19:44*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159723-1

Client Sample ID: MW-154S_110821
Date Collected: 11/08/21 11:33
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159723-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 04:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*		*11/18/21 04:02*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 20:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 20:06	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 20:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 20:06	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 20:06	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 20:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*120*		*62 - 137*		*11/17/21 20:06*	*1*
4-Bromofluorobenzene (Surr)	*67*		*56 - 136*		*11/17/21 20:06*	*1*
Toluene-d8 (Surr)	*87*		*78 - 122*		*11/17/21 20:06*	*1*
Dibromofluoromethane (Surr)	*103*		*73 - 120*		*11/17/21 20:06*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159723-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159723-1	TRIP BLANK_88	116	66	85	101
240-159723-2	MW-154S_110821	120	67	87	103
240-159724-A-2 MS	Matrix Spike	96	99	103	84
240-159724-C-2 MSD	Matrix Spike Duplicate	97	97	106	86
LCS 240-513417/4	Lab Control Sample	93	97	98	84
MB 240-513417/7	Method Blank	105	76	89	91

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159636-H-2 MS	Matrix Spike	77
240-159636-N-2 MSD	Matrix Spike Duplicate	77
240-159723-2	MW-154S_110821	75
LCS 240-513479/4	Lab Control Sample	78
MB 240-513479/5	Method Blank	77

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513417/7
Matrix: Water
Analysis Batch: 513417

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 13:33	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 13:33	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 13:33	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 13:33	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 13:33	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 13:33	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/17/21 13:33*	*1*
4-Bromofluorobenzene (Surr)	*76*		*56 - 136*		*11/17/21 13:33*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/17/21 13:33*	*1*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*11/17/21 13:33*	*1*

Lab Sample ID: LCS 240-513417/4
Matrix: Water
Analysis Batch: 513417

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.24		ug/L		92	63 - 134
cis-1,2-Dichloroethene	10.0	9.72		ug/L		97	77 - 123
Tetrachloroethene	10.0	9.53		ug/L		95	76 - 123
trans-1,2-Dichloroethene	10.0	10.1		ug/L		101	75 - 124
Trichloroethene	10.0	8.80		ug/L		88	70 - 122
Vinyl chloride	10.0	11.6		ug/L		116	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*97*		*56 - 136*
Toluene-d8 (Surr)	*98*		*78 - 122*
Dibromofluoromethane (Surr)	*84*		*73 - 120*

Lab Sample ID: 240-159724-A-2 MS
Matrix: Water
Analysis Batch: 513417

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	8.39		ug/L		84	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	8.85		ug/L		88	66 - 128
Tetrachloroethene	1.0	U	10.0	8.96		ug/L		90	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.58		ug/L		96	56 - 136
Trichloroethene	1.0	U	10.0	7.89		ug/L		79	61 - 124
Vinyl chloride	2.8		10.0	14.2		ug/L		114	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*
4-Bromofluorobenzene (Surr)	*99*		*56 - 136*
Toluene-d8 (Surr)	*103*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159724-A-2 MS
Matrix: Water
Analysis Batch: 513417

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	*84*		*73 - 120*

Lab Sample ID: 240-159724-C-2 MSD
Matrix: Water
Analysis Batch: 513417

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	7.80		ug/L		78	56 - 135	7	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.45		ug/L		95	66 - 128	7	14
Tetrachloroethene	1.0	U	10.0	9.27		ug/L		93	62 - 131	3	20
trans-1,2-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	56 - 136	8	15
Trichloroethene	1.0	U	10.0	8.32		ug/L		83	61 - 124	5	15
Vinyl chloride	2.8		10.0	15.8		ug/L		130	43 - 157	11	24

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*97*		*62 - 137*
4-Bromofluorobenzene (Surr)	*97*		*56 - 136*
Toluene-d8 (Surr)	*106*		*78 - 122*
Dibromofluoromethane (Surr)	*86*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513479/5
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 17:41	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*		*11/17/21 17:41*	*1*

Lab Sample ID: LCS 240-513479/4
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	11.9		ug/L		119	80 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*

Lab Sample ID: 240-159636-H-2 MS
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

Lab Sample ID: 240-159636-N-2 MSD
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153	0	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159723-1

GC/MS VOA

Analysis Batch: 513417

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159723-1	TRIP BLANK_88	Total/NA	Water	8260B	
240-159723-2	MW-154S_110821	Total/NA	Water	8260B	
MB 240-513417/7	Method Blank	Total/NA	Water	8260B	
LCS 240-513417/4	Lab Control Sample	Total/NA	Water	8260B	
240-159724-A-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159724-C-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 513479

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159723-2	MW-154S_110821	Total/NA	Water	8260B SIM	
MB 240-513479/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513479/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159636-H-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159636-N-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159723-1

Client Sample ID: TRIP BLANK_88

Lab Sample ID: 240-159723-1

Date Collected: 11/08/21 00:00

Matrix: Water

Date Received: 11/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513417	11/17/21 19:44	LEE	TAL CAN

Client Sample ID: MW-154S_110821

Lab Sample ID: 240-159723-2

Date Collected: 11/08/21 11:33

Matrix: Water

Date Received: 11/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513417	11/17/21 20:06	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513479	11/18/21 04:02	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159723-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN
190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Andrew Barth	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day — 10 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 23	---	---		X						1					N	G	X	X	X	X	X	X	★	1 Trip Blank
MW-1545_110821	11/8/21	1133		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159723 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalla@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	11/8/21 1630	Novi, Cold storage	Arcadis	11/8/21 1630
[signature]	ARCADIS	11/9/21 / 1040	[signature]	ETA	11/9/21 1040
[signature]	ETA	11/9/21 1055	[signature]	ETA	11-10-21 8:00

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11/24/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159723**
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Marilyn Bleau

Cooler Received on 11-10-21 Opened on 11-10-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity_____	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC157842
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #_____	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

No SIM on TB per corrected COC. DMR 11-10-21

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

Login # : 159723

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form				
Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
TA Client Box Other	IR-14 IR-15	0-6	0-7	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15	0-7	0-8	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15	

DATA VERIFICATION REPORT

November 25, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159723-1
Sample date: 2021-11-08
Report received by CADENA: 2021-11-24
Initial Data Verification completed by CADENA: 2021-11-25
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159723-1

		Sample Name:	TRIP BLANK_88				MW-154S_110821			
		Lab Sample ID:	2401597231				2401597232			
		Sample Date:	11/8/2021				11/8/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

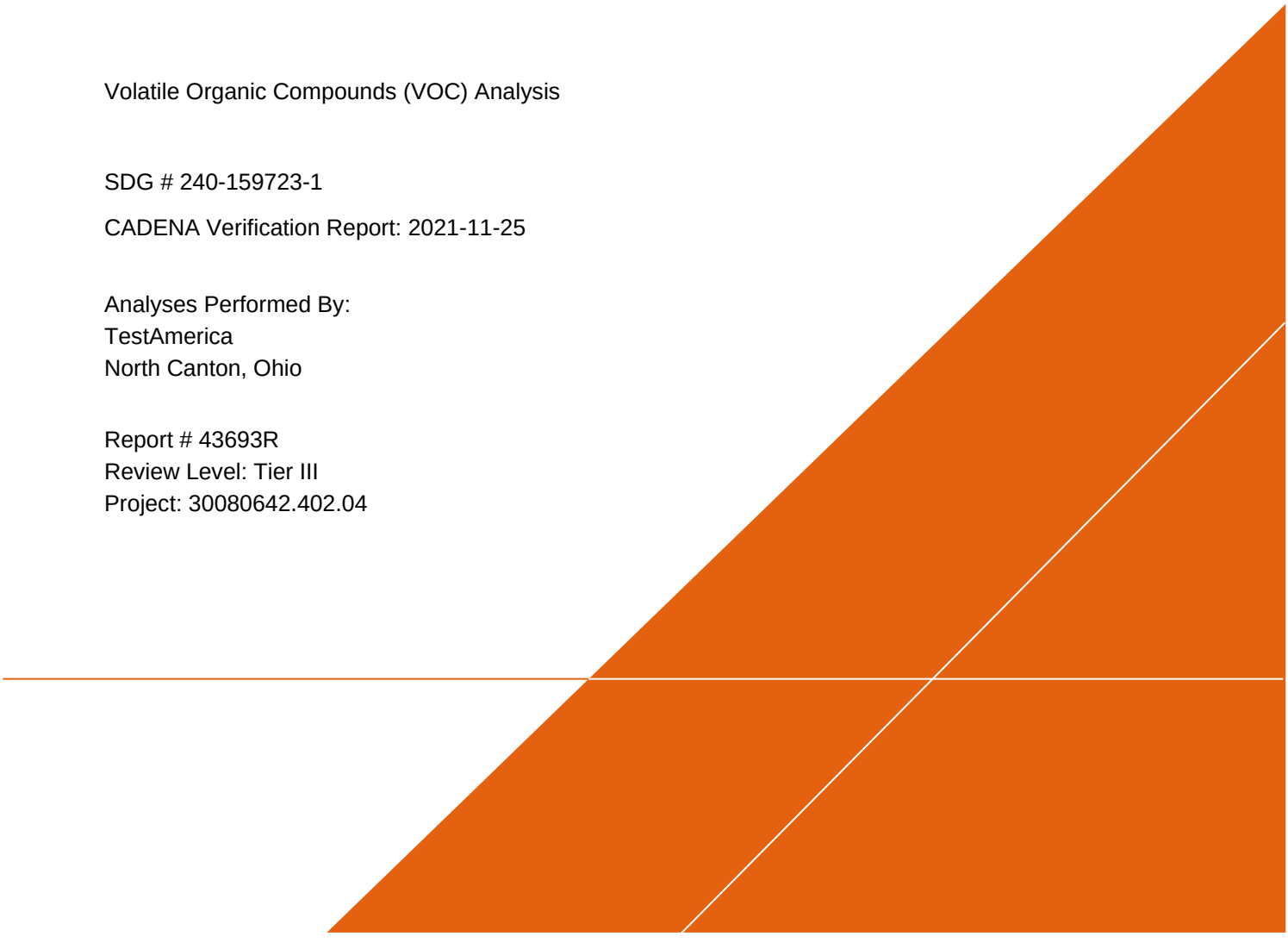
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159723-1

CADENA Verification Report: 2021-11-25

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43693R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159723-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_88	240-159723-1	Water	11/08/21		X	
MW-154S_110821	240-159723-2	Water	11/08/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 13, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN
190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Andrew Barth	TAT if different from below: 10 day; ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 28	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-154S_110821	11/8/21	1133		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159723 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalla@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	11/8/21 1630	Novi, Cold Storage	Arcadis	11/8/21 1630
[signature]	ARCADIS	11/9/21 / 1040	[signature]	ETA	11/9/21 1040
[signature]	ETA	11/9/21 1055	[signature]	ETA	11-10-21 8:00

Received in Laboratory by:

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11/24/2021

Client Sample ID: TRIP BLANK_88
Lab Sample ID: 240-159723-1
Date Collected: 11/08/21 00:00
Matrix: Water
Date Received: 11/10/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 19:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 19:44	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 19:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 19:44	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 19:44	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 19:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*62 - 137*		*11/17/21 19:44*	*1*
4-Bromofluorobenzene (Surr)	*66*		*56 - 136*		*11/17/21 19:44*	*1*
Toluene-d8 (Surr)	*85*		*78 - 122*		*11/17/21 19:44*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/17/21 19:44*	*1*

Client Sample ID: MW-154S_110821
Lab Sample ID: 240-159723-2
Date Collected: 11/08/21 11:33
Matrix: Water
Date Received: 11/10/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 04:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*		*11/18/21 04:02*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 20:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 20:06	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 20:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 20:06	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 20:06	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 20:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*120*		*62 - 137*		*11/17/21 20:06*	*1*
4-Bromofluorobenzene (Surr)	*67*		*56 - 136*		*11/17/21 20:06*	*1*
Toluene-d8 (Surr)	*87*		*78 - 122*		*11/17/21 20:06*	*1*
Dibromofluoromethane (Surr)	*103*		*73 - 120*		*11/17/21 20:06*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159130-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/17/2021 10:48:57 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at:
www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159130-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159130-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159130-1

Comments
No additional comments.

Receipt
The samples were received on 11/3/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.2° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159130-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159130-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159130-1	TRIP BLANK_13	Water	11/01/21 00:00	11/03/21 08:00
240-159130-2	MW-182S_110121	Water	11/01/21 14:26	11/03/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159130-1

Client Sample ID: TRIP BLANK_13 — Lab Sample ID: 240-159130-1

No Detections.

Client Sample ID: MW-182S_110121 — Lab Sample ID: 240-159130-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159130-1

Client Sample ID: TRIP BLANK_13
Date Collected: 11/01/21 00:00
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159130-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 00:43	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 00:43	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 00:43	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 00:43	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 00:43	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 00:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/11/21 00:43*	*1*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*		*11/11/21 00:43*	*1*
Toluene-d8 (Surr)	*107*		*78 - 122*		*11/11/21 00:43*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*11/11/21 00:43*	*1*

Client Sample ID: MW-182S_110121

Date Collected: 11/01/21 14:26
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159130-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/04/21 20:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*90*		*66 - 120*		*11/04/21 20:25*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 01:05	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 01:05	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 01:05	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 01:05	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 01:05	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 01:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*		*11/11/21 01:05*	*1*
4-Bromofluorobenzene (Surr)	*79*		*56 - 136*		*11/11/21 01:05*	*1*
Toluene-d8 (Surr)	*100*		*78 - 122*		*11/11/21 01:05*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*11/11/21 01:05*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159130-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159130-1	TRIP BLANK_13	92	78	107	92
240-159130-2	MW-182S_110121	90	79	100	92
240-159143-E-3 MSD	Matrix Spike Duplicate	94	97	117	95
240-159143-H-3 MS	Matrix Spike	90	88	108	92
LCS 240-512327/4	Lab Control Sample	88	84	107	90
MB 240-512327/6	Method Blank	92	78	103	91

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159130-2	MW-182S_110121	90
240-159143-G-3 MS	Matrix Spike	91
240-159143-M-3 MSD	Matrix Spike Duplicate	89
LCS 240-511462/4	Lab Control Sample	89
MB 240-511462/5	Method Blank	93

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512327/6
Matrix: Water
Analysis Batch: 512327

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/10/21 23:58	1
cis-1,2-Dichloroethene	0.541	J	1.0	0.46	ug/L			11/10/21 23:58	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/10/21 23:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/10/21 23:58	1
Trichloroethene	0.468	J	1.0	0.44	ug/L			11/10/21 23:58	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/10/21 23:58	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/10/21 23:58*	*1*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*		*11/10/21 23:58*	*1*
Toluene-d8 (Surr)	*103*		*78 - 122*		*11/10/21 23:58*	*1*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*11/10/21 23:58*	*1*

Lab Sample ID: LCS 240-512327/4
Matrix: Water
Analysis Batch: 512327

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.4		ug/L		104	63 - 134
cis-1,2-Dichloroethene	10.0	10.7		ug/L		107	77 - 123
Tetrachloroethene	10.0	10.6		ug/L		106	76 - 123
trans-1,2-Dichloroethene	10.0	10.0		ug/L		100	75 - 124
Trichloroethene	10.0	9.37		ug/L		94	70 - 122
Vinyl chloride	10.0	8.92		ug/L		89	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*62 - 137*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*
Toluene-d8 (Surr)	*107*		*78 - 122*
Dibromofluoromethane (Surr)	*90*		*73 - 120*

Lab Sample ID: 240-159143-E-3 MSD
Matrix: Water
Analysis Batch: 512327

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.21		ug/L		92	56 - 135	1	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.70		ug/L		97	66 - 128	4	14
Tetrachloroethene	1.0	U	10.0	8.77		ug/L		88	62 - 131	10	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.34		ug/L		93	56 - 136	4	15
Trichloroethene	1.0	U	10.0	7.92		ug/L		79	61 - 124	6	15
Vinyl chloride	1.0	U	10.0	10.1		ug/L		101	43 - 157	6	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*94*		*62 - 137*
4-Bromofluorobenzene (Surr)	*97*		*56 - 136*
Toluene-d8 (Surr)	*117*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159143-E-3 MSD
Matrix: Water
Analysis Batch: 512327

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*95*		*73 - 120*

Lab Sample ID: 240-159143-H-3 MS
Matrix: Water
Analysis Batch: 512327

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.32		ug/L		93	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.36		ug/L		94	66 - 128
Tetrachloroethene	1.0	U	10.0	7.97		ug/L		80	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	8.94		ug/L		89	56 - 136
Trichloroethene	1.0	U	10.0	7.46		ug/L		75	61 - 124
Vinyl chloride	1.0	U	10.0	9.56		ug/L		96	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*88*		*56 - 136*
Toluene-d8 (Surr)	*108*		*78 - 122*
Dibromofluoromethane (Surr)	*92*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-511462/5
Matrix: Water
Analysis Batch: 511462

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/04/21 15:32	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*66 - 120*		*11/04/21 15:32*	*1*

Lab Sample ID: LCS 240-511462/4
Matrix: Water
Analysis Batch: 511462

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.58		ug/L		96	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*66 - 120*

Lab Sample ID: 240-159143-G-3 MS
Matrix: Water
Analysis Batch: 511462

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	9.25		ug/L		92	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*91*		*66 - 120*

Lab Sample ID: 240-159143-M-3 MSD
Matrix: Water
Analysis Batch: 511462

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.63		ug/L		96	51 - 153	4	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*89*		*66 - 120*

GC/MS VOA

Analysis Batch: 511462

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159130-2	MW-182S_110121	Total/NA	Water	8260B SIM	
MB 240-511462/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-511462/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159143-G-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159143-M-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 512327

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159130-1	TRIP BLANK_13	Total/NA	Water	8260B	
240-159130-2	MW-182S_110121	Total/NA	Water	8260B	
MB 240-512327/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512327/4	Lab Control Sample	Total/NA	Water	8260B	
240-159143-E-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	
240-159143-H-3 MS	Matrix Spike	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159130-1

Client Sample ID: TRIP BLANK_13

Lab Sample ID: 240-159130-1

Date Collected: 11/01/21 00:00

Matrix: Water

Date Received: 11/03/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512327	11/11/21 00:43	LEE	TAL CAN

Client Sample ID: MW-182S_110121

Lab Sample ID: 240-159130-2

Date Collected: 11/01/21 14:26

Matrix: Water

Date Received: 11/03/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512327	11/11/21 01:05	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	511462	11/04/21 20:25	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159130-1

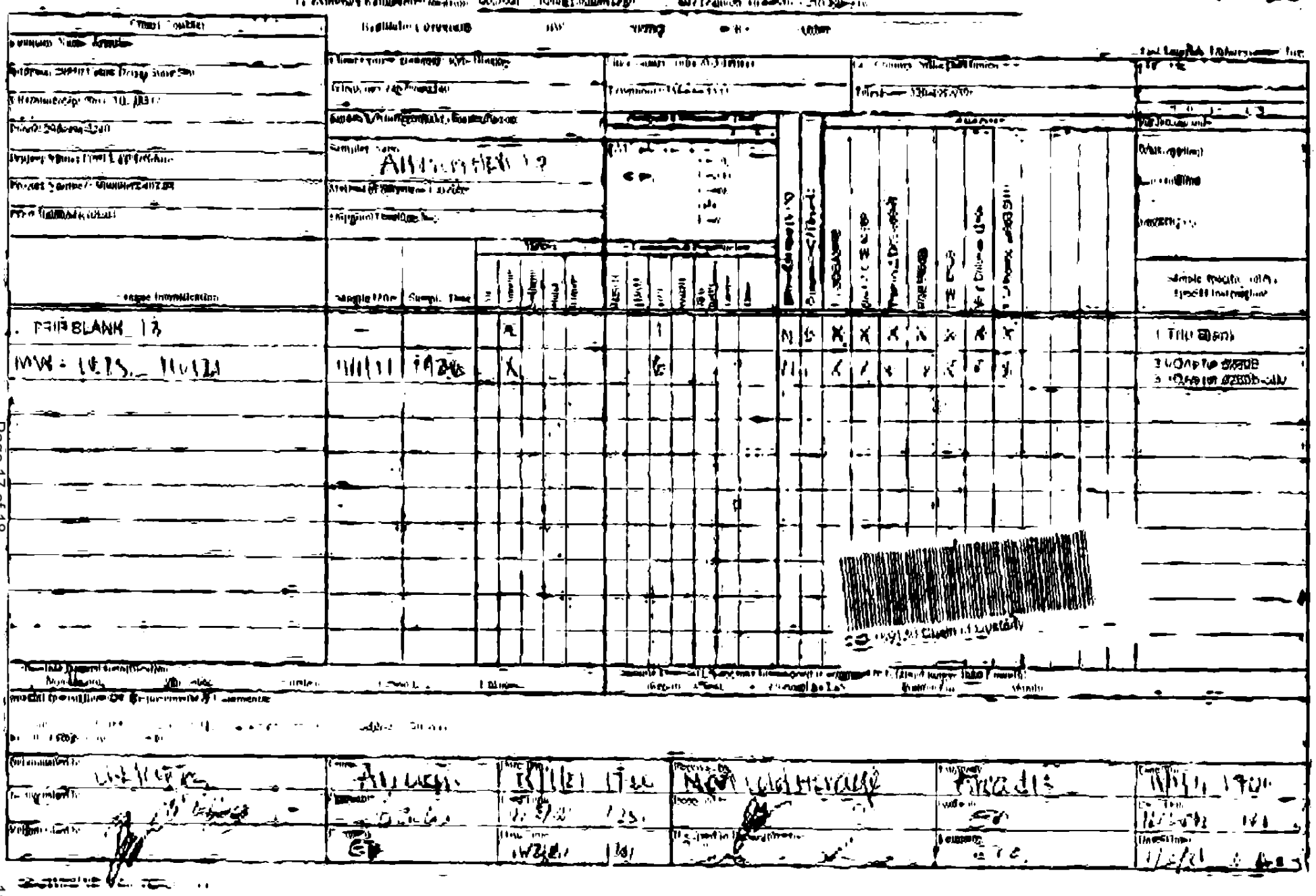
Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

TestAmerica



Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159130**
Canton Facility

Client ARCADIS Site Name

Cooler Received on 11/3/21 Opened on 11/3/21

Cooler unpacked by: Matthew Sivma

FedEx 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours. Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used (Bubble Wrap) Foam Plastic Bag None Other

COOLANT (Wet Ice) Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp 0.1 °C Corrected Cooler Temp. 0.2 °C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2	Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes) No
	Were the seals on the outside of the cooler(s) signed & dated?	(Yes) No NA
	Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes (No)
	-Were tamper/custody seals intact and uncompromised?	(Yes) No NA
3	Shippers' packing slip attached to the cooler(s)?	Yes (No)
4	Did custody papers accompany the sample(s)?	(Yes) No
5	Were the custody papers relinquished & signed in the appropriate place?	(Yes) No
6	Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes) No NMB
7	Did all bottles arrive in good condition (Unbroken)?	(Yes) No
8	Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes) No
9	For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?	
10	Were correct bottle(s) used for the test(s) indicated?	(Yes) No
11	Sufficient quantity received to perform indicated analyses?	(Yes) No
12	Are these work share samples and all listed on the COC?	Yes (No)
	If yes, Questions 13 17 have been checked at the originating laboratory	
13	Were all preserved sample(s) at the correct pH upon receipt?	Yes No (NA) pH Strip Lot# HC157842
14	Were VOAs on the COC?	(Yes) No
15	Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes (No) NA
16	Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 010420 16	(Yes) No
17	Was a LL Hg or Me Hg trip blank present?	Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

trip blank does not receive 8260D SIM BB

19 SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.

Sample(s) were received in a broken container

Sample(s) were received with bubble >6 mm in diameter (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory

Time preserved Preservative(s) added/Lot number(s)

VOA Sample Preservation Date/Time VOAs Frozen

DATA VERIFICATION REPORT

November 17, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159130-1
Sample date: 2021-11-01
Report received by CADENA: 2021-11-17
Initial Data Verification completed by CADENA: 2021-11-17
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 512327 method blank had detections below the RL for the following analytes: CIS-1,2-DICHLOROETHENE and TRICHLOROETHENE. Qualification of client sample results was not required based on these method blank detections.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159130-1

		Sample Name:	TRIP BLANK_13				MW-182S_110121			
		Lab Sample ID:	2401591301				2401591302			
		Sample Date:	11/1/2021				11/1/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

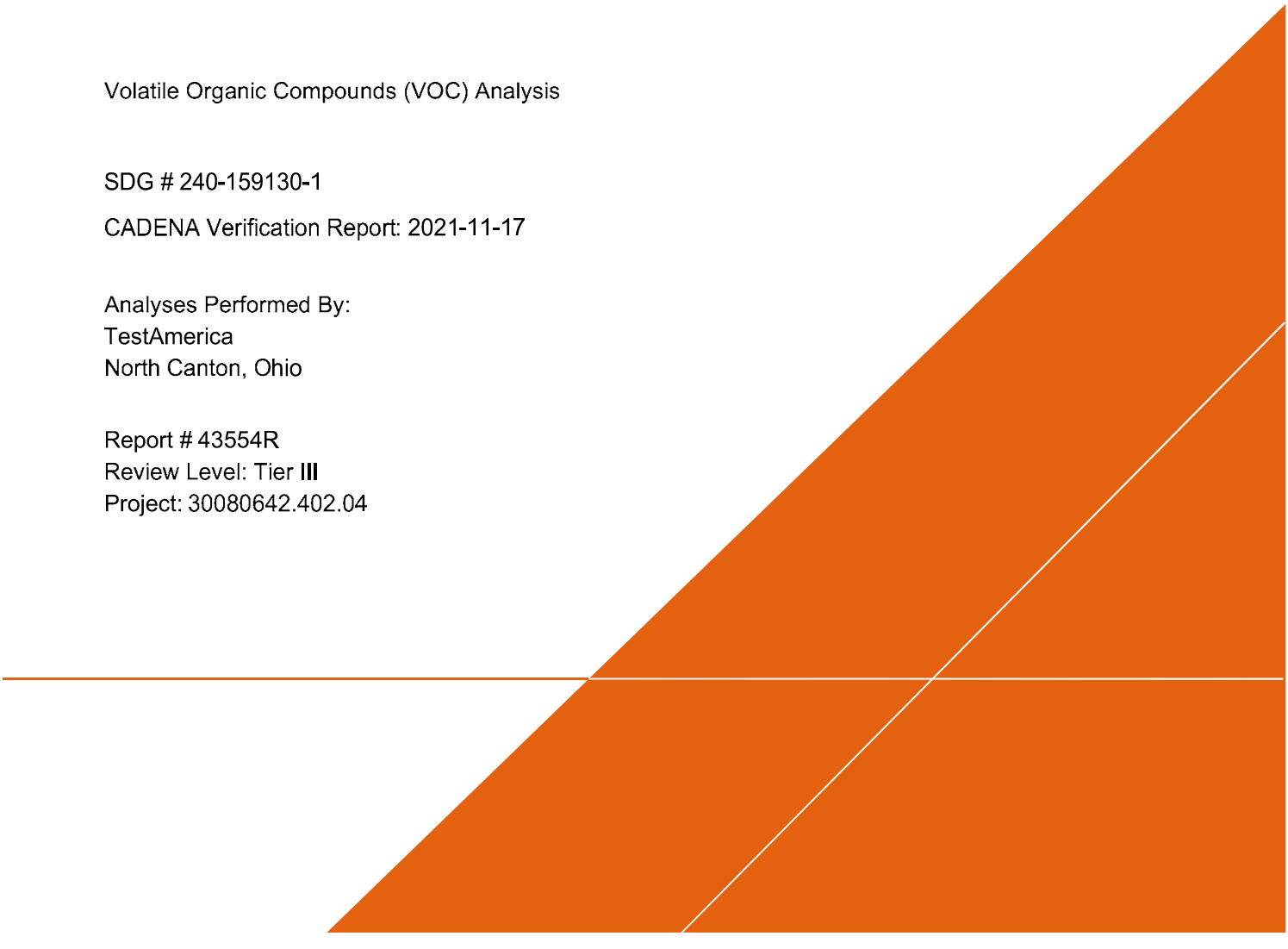
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159130-1

CADENA Verification Report: 2021-11-17

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43554R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159130-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_13	240-159130-1	Water	11/01/21		X	
MW-182S_110121	240-159130-2	Water	11/01/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable, and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE: 

DATE: December 02, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 2, 2021

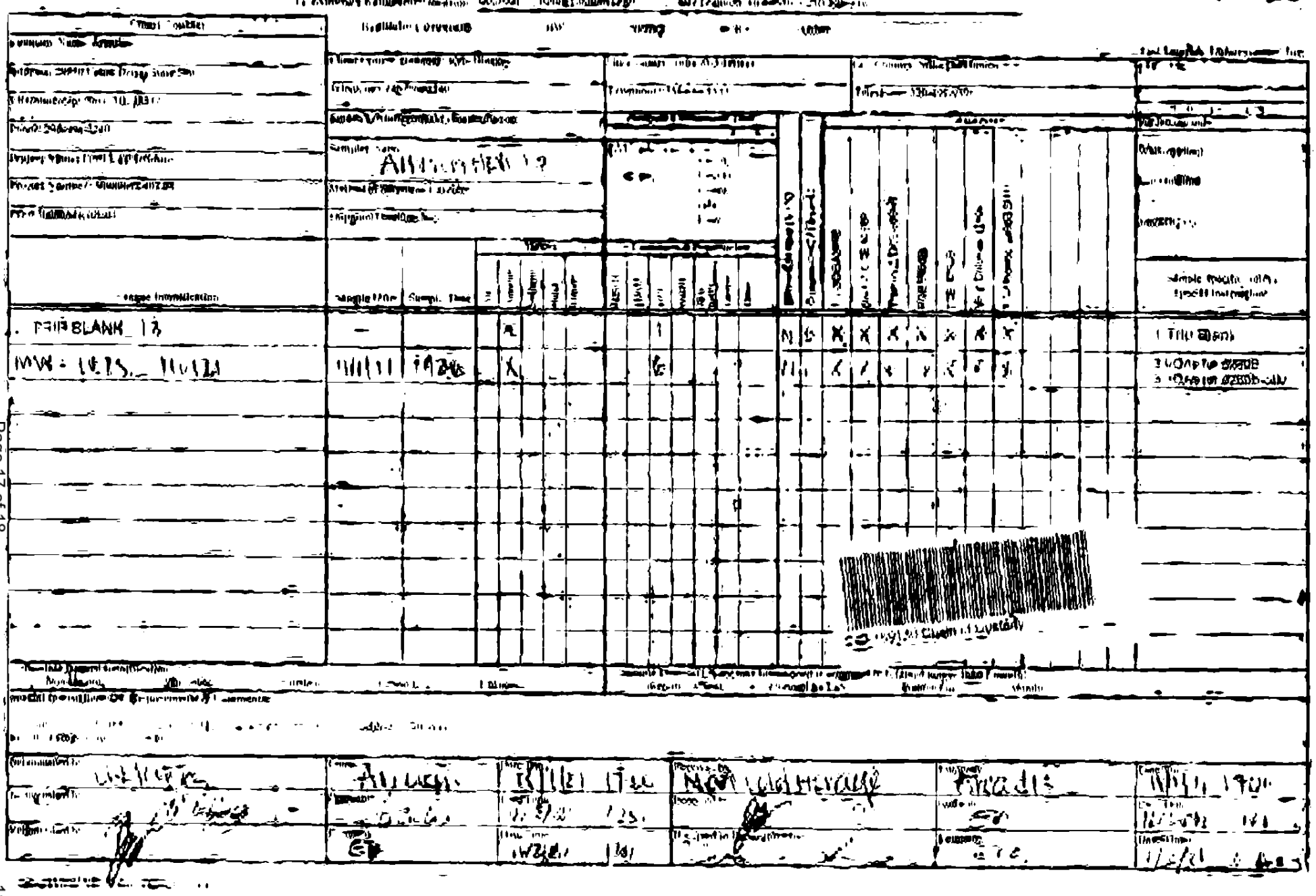
NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica



Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159130-1

Client Sample ID: TRIP BLANK_13
Date Collected: 11/01/21 00:00
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159130-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 00:43	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 00:43	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 00:43	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 00:43	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 00:43	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 00:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/11/21 00:43*	*1*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*		*11/11/21 00:43*	*1*
Toluene-d8 (Surr)	*107*		*78 - 122*		*11/11/21 00:43*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*11/11/21 00:43*	*1*

Client Sample ID: MW-182S_110121

Date Collected: 11/01/21 14:26
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159130-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/04/21 20:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*90*		*66 - 120*		*11/04/21 20:25*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 01:05	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 01:05	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 01:05	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 01:05	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 01:05	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 01:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*		*11/11/21 01:05*	*1*
4-Bromofluorobenzene (Surr)	*79*		*56 - 136*		*11/11/21 01:05*	*1*
Toluene-d8 (Surr)	*100*		*78 - 122*		*11/11/21 01:05*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*11/11/21 01:05*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159137-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/17/2021 10:50:39 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159137-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159137-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159137-1

Comments
No additional comments.

Receipt
The samples were received on 11/3/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.2° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159137-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159137-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159137-1	TRIP BLANK_12	Water	11/01/21 00:00	11/03/21 08:00
240-159137-2	MW-225S_110121	Water	11/01/21 13:06	11/03/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159137-1

Client Sample ID: TRIP BLANK_12 — Lab Sample ID: 240-159137-1

No Detections.

Client Sample ID: MW-225S_110121 — Lab Sample ID: 240-159137-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159137-1

Client Sample ID: TRIP BLANK_12
Date Collected: 11/01/21 00:00
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159137-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 03:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 03:19	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 03:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 03:19	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 03:19	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 03:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*62 - 137*		*11/11/21 03:19*	*1*
4-Bromofluorobenzene (Surr)	*75*		*56 - 136*		*11/11/21 03:19*	*1*
Toluene-d8 (Surr)	*97*		*78 - 122*		*11/11/21 03:19*	*1*
Dibromofluoromethane (Surr)	*87*		*73 - 120*		*11/11/21 03:19*	*1*

Client Sample ID: MW-225S_110121
Date Collected: 11/01/21 13:06
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159137-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/04/21 23:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*66 - 120*		*11/04/21 23:13*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 03:41	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 03:41	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 03:41	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 03:41	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 03:41	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 03:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*62 - 137*		*11/11/21 03:41*	*1*
4-Bromofluorobenzene (Surr)	*80*		*56 - 136*		*11/11/21 03:41*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/11/21 03:41*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*11/11/21 03:41*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159137-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159137-1	TRIP BLANK_12	85	75	97	87
240-159137-2	MW-225S_110121	94	80	108	95
240-159143-E-3 MSD	Matrix Spike Duplicate	94	97	117	95
240-159143-H-3 MS	Matrix Spike	90	88	108	92
LCS 240-512327/4	Lab Control Sample	88	84	107	90
MB 240-512327/6	Method Blank	92	78	103	91

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159137-2	MW-225S_110121	94
240-159143-G-3 MS	Matrix Spike	91
240-159143-M-3 MSD	Matrix Spike Duplicate	89
LCS 240-511462/4	Lab Control Sample	89
MB 240-511462/5	Method Blank	93

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512327/6
Matrix: Water
Analysis Batch: 512327

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/10/21 23:58	1
cis-1,2-Dichloroethene	0.541	J	1.0	0.46	ug/L			11/10/21 23:58	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/10/21 23:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/10/21 23:58	1
Trichloroethene	0.468	J	1.0	0.44	ug/L			11/10/21 23:58	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/10/21 23:58	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/10/21 23:58*	*1*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*		*11/10/21 23:58*	*1*
Toluene-d8 (Surr)	*103*		*78 - 122*		*11/10/21 23:58*	*1*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*11/10/21 23:58*	*1*

Lab Sample ID: LCS 240-512327/4
Matrix: Water
Analysis Batch: 512327

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.4		ug/L		104	63 - 134
cis-1,2-Dichloroethene	10.0	10.7		ug/L		107	77 - 123
Tetrachloroethene	10.0	10.6		ug/L		106	76 - 123
trans-1,2-Dichloroethene	10.0	10.0		ug/L		100	75 - 124
Trichloroethene	10.0	9.37		ug/L		94	70 - 122
Vinyl chloride	10.0	8.92		ug/L		89	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*62 - 137*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*
Toluene-d8 (Surr)	*107*		*78 - 122*
Dibromofluoromethane (Surr)	*90*		*73 - 120*

Lab Sample ID: 240-159143-E-3 MSD
Matrix: Water
Analysis Batch: 512327

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.21		ug/L		92	56 - 135	1	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.70		ug/L		97	66 - 128	4	14
Tetrachloroethene	1.0	U	10.0	8.77		ug/L		88	62 - 131	10	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.34		ug/L		93	56 - 136	4	15
Trichloroethene	1.0	U	10.0	7.92		ug/L		79	61 - 124	6	15
Vinyl chloride	1.0	U	10.0	10.1		ug/L		101	43 - 157	6	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*94*		*62 - 137*
4-Bromofluorobenzene (Surr)	*97*		*56 - 136*
Toluene-d8 (Surr)	*117*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159143-E-3 MSD
Matrix: Water
Analysis Batch: 512327

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*95*		*73 - 120*

Lab Sample ID: 240-159143-H-3 MS
Matrix: Water
Analysis Batch: 512327

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.32		ug/L		93	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.36		ug/L		94	66 - 128
Tetrachloroethene	1.0	U	10.0	7.97		ug/L		80	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	8.94		ug/L		89	56 - 136
Trichloroethene	1.0	U	10.0	7.46		ug/L		75	61 - 124
Vinyl chloride	1.0	U	10.0	9.56		ug/L		96	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*88*		*56 - 136*
Toluene-d8 (Surr)	*108*		*78 - 122*
Dibromofluoromethane (Surr)	*92*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-511462/5
Matrix: Water
Analysis Batch: 511462

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/04/21 15:32	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*66 - 120*		*11/04/21 15:32*	*1*

Lab Sample ID: LCS 240-511462/4
Matrix: Water
Analysis Batch: 511462

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.58		ug/L		96	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*66 - 120*

Lab Sample ID: 240-159143-G-3 MS
Matrix: Water
Analysis Batch: 511462

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	9.25		ug/L		92	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*91*		*66 - 120*

Lab Sample ID: 240-159143-M-3 MSD
Matrix: Water
Analysis Batch: 511462

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.63		ug/L		96	51 - 153	4	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*89*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159137-1

GC/MS VOA

Analysis Batch: 511462

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159137-2	MW-225S_110121	Total/NA	Water	8260B SIM	
MB 240-511462/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-511462/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159143-G-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159143-M-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 512327

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159137-1	TRIP BLANK_12	Total/NA	Water	8260B	
240-159137-2	MW-225S_110121	Total/NA	Water	8260B	
MB 240-512327/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512327/4	Lab Control Sample	Total/NA	Water	8260B	
240-159143-E-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	
240-159143-H-3 MS	Matrix Spike	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159137-1

Client Sample ID: TRIP BLANK_12

Lab Sample ID: 240-159137-1

Date Collected: 11/01/21 00:00

Matrix: Water

Date Received: 11/03/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512327	11/11/21 03:19	LEE	TAL CAN

Client Sample ID: MW-225S_110121

Lab Sample ID: 240-159137-2

Date Collected: 11/01/21 13:06

Matrix: Water

Date Received: 11/03/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512327	11/11/21 03:41	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	511462	11/04/21 23:13	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

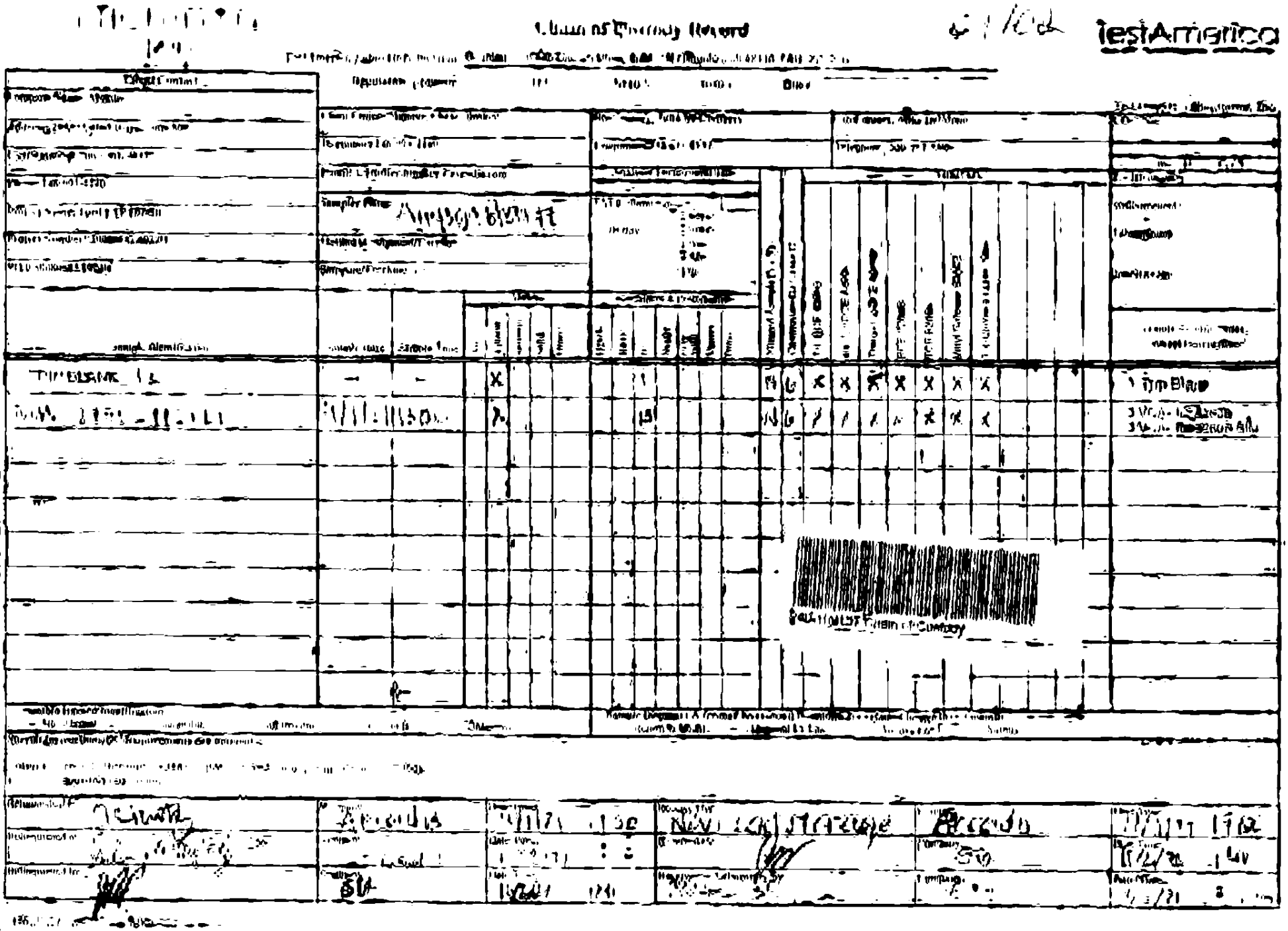
Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159137-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21



Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 159139
Canton Facility

Client ARCADIS Site Name _____ Cooler unpacked by: Matthew Swma

Cooler Received on 11/3/21 Opened on 11/3/21

FedEx 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours. Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used Bubble Wrap Foam Plastic Bag None Other _____

COOLANT Wet Ice Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0 1 °C Corrected Cooler Temp 0 2 °C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp _____ °C

2 Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No

-Were the seals on the outside of the cooler(s) signed & dated? Yes No NA

-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No

-Were tamper/custody seals intact and uncompromised? Yes No NA

3 Shippers' packing slip attached to the cooler(s)? Yes No

4 Did custody papers accompany the sample(s)? Yes No

5 Were the custody papers relinquished & signed in the appropriate place? Yes No

6 Was/were the person(s) who collected the samples clearly identified on the COC? Yes ~~No~~ BB

7 Did all bottles arrive in good condition (Unbroken)? Yes No

8 Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes No

9 For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?

10 Were correct bottle(s) used for the test(s) indicated? Yes No

11 Sufficient quantity received to perform indicated analyses? BB ~~Yes~~ No

12 Are these work share samples and all listed on the COC? Yes No

If yes, Questions 13 17 have been checked at the originating laboratory

13 Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# **HC157842**

14 Were VOAs on the COC? Yes No

15 Were air bubbles >6 mm in any VOA vials? ● ← Larger than this Yes No NA

16 Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 0104201G Yes No

17 Was a LL Hg or Me Hg trip blank present? _____ Yes No

Tests that are not checked for pH by Receiving.

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page Samples processed by:

trip blank does not receive 8260 SIM - BB

19 SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container

Sample(s) _____ were received with bubble >6 mm in diameter (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory

Time preserved _____ Preservative(s) added/Lot number(s) _____

VOA Sample Preservation Date/Time VOAs Frozen. _____

WI-NC-099

DATA VERIFICATION REPORT

November 17, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159137-1
Sample date: 2021-11-01
Report received by CADENA: 2021-11-17
Initial Data Verification completed by CADENA: 2021-11-17
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 512327 method blank had detections below the RL for the following analytes: CIS-1,2-DICHLOROETHENE and TRICHLOROETHENE. Qualification of client sample results was not required based on these method blank detections.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159137-1

		Sample Name:	TRIP BLANK_12				MW-225S_110121			
		Lab Sample ID:	2401591371				2401591372			
		Sample Date:	11/1/2021				11/1/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

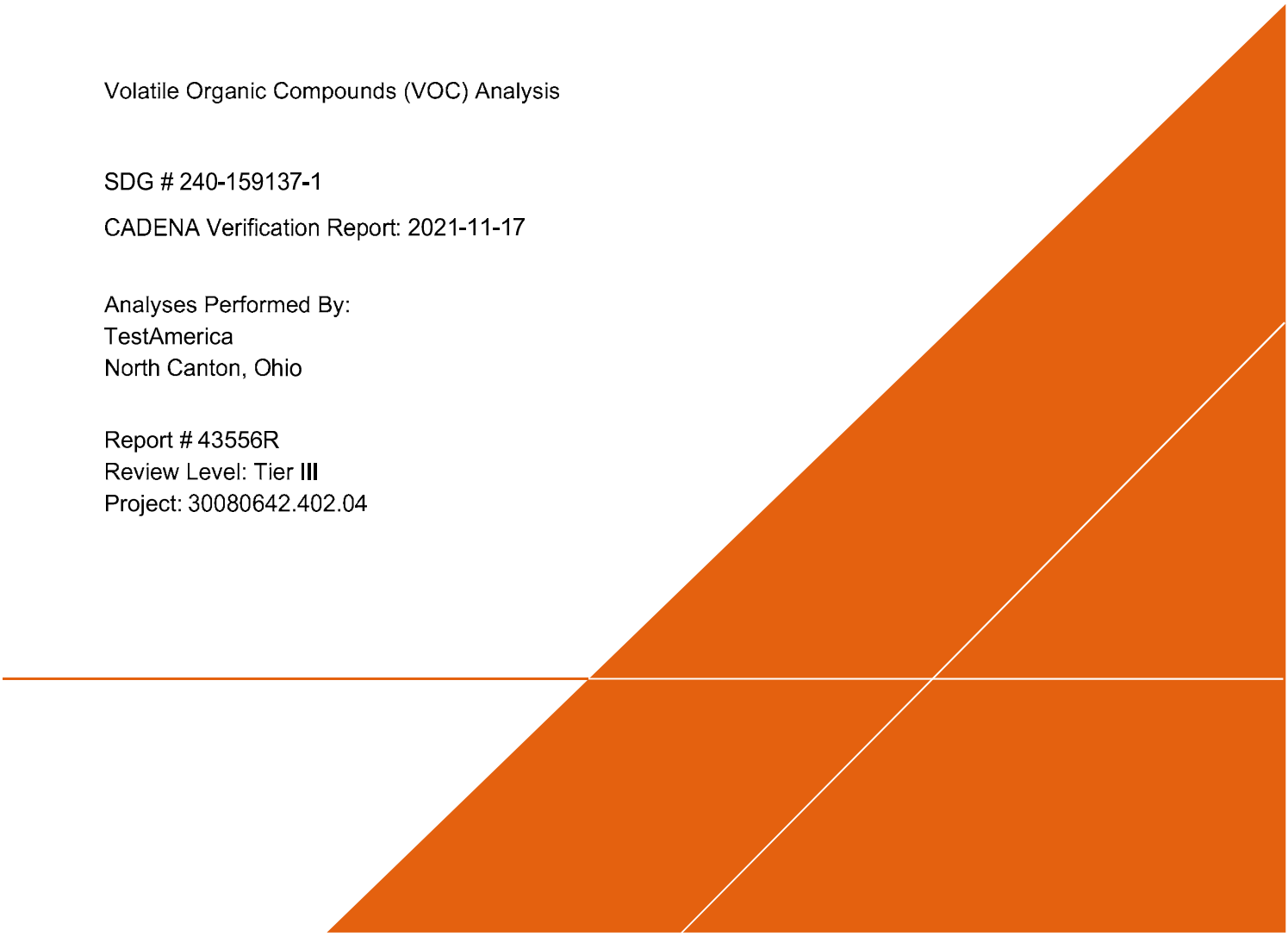
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159137-1

CADENA Verification Report: 2021-11-17

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43556R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159137-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_12	240-159137-1	Water	11/01/21		X	
MW-225S_110121	240-159137-2	Water	11/01/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE: 

DATE: December 02, 2021

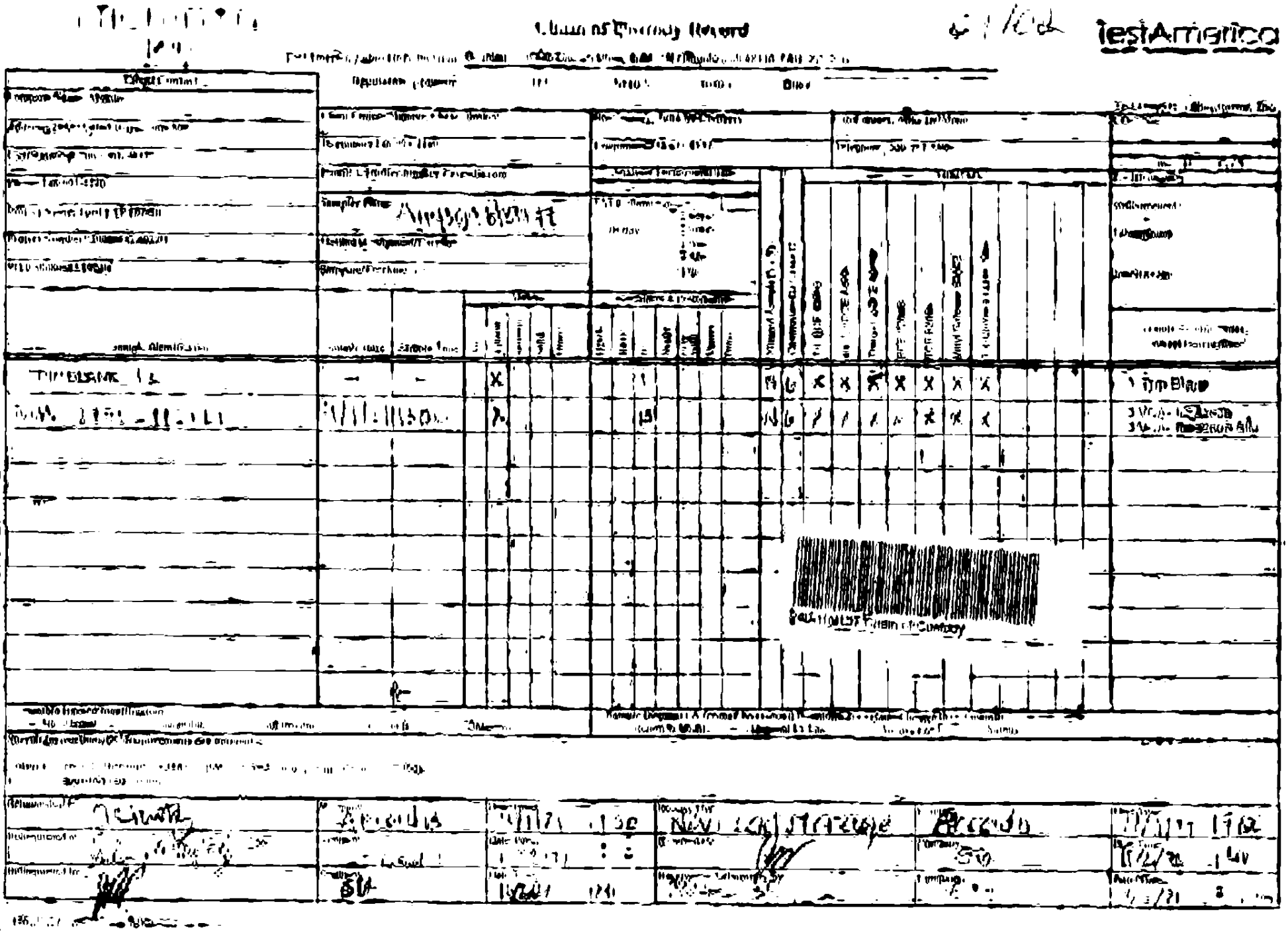
PEER REVIEW: Andrew Korycinski

DATE: December 2, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159137-1

Client Sample ID: TRIP BLANK_12
Date Collected: 11/01/21 00:00
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159137-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 03:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 03:19	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 03:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 03:19	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 03:19	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 03:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*62 - 137*		*11/11/21 03:19*	*1*
4-Bromofluorobenzene (Surr)	*75*		*56 - 136*		*11/11/21 03:19*	*1*
Toluene-d8 (Surr)	*97*		*78 - 122*		*11/11/21 03:19*	*1*
Dibromofluoromethane (Surr)	*87*		*73 - 120*		*11/11/21 03:19*	*1*

Client Sample ID: MW-225S_110121
Date Collected: 11/01/21 13:06
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159137-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/04/21 23:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*66 - 120*		*11/04/21 23:13*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 03:41	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 03:41	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 03:41	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 03:41	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 03:41	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 03:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*62 - 137*		*11/11/21 03:41*	*1*
4-Bromofluorobenzene (Surr)	*80*		*56 - 136*		*11/11/21 03:41*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/11/21 03:41*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*11/11/21 03:41*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159719-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/24/2021 8:30:09 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159719-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159719-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159719-1

Comments
No additional comments.

Receipt
The samples were received on 11/10/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 0.7° C and 0.8° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159719-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159719-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159719-1	TRIP BLANK_90	Water	11/08/21 00:00	11/10/21 08:00
240-159719-2	MW-110S_110821	Water	11/08/21 15:16	11/10/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159719-1

Client Sample ID: TRIP BLANK_90 — Lab Sample ID: 240-159719-1

No Detections.

Client Sample ID: MW-110S_110821 — Lab Sample ID: 240-159719-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159719-1

Client Sample ID: TRIP BLANK_90
Date Collected: 11/08/21 00:00
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159719-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 19:01	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 19:01	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 19:01	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 19:01	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 19:01	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 19:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*115*		*62 - 137*		*11/17/21 19:01*	*1*
4-Bromofluorobenzene (Surr)	*71*		*56 - 136*		*11/17/21 19:01*	*1*
Toluene-d8 (Surr)	*85*		*78 - 122*		*11/17/21 19:01*	*1*
Dibromofluoromethane (Surr)	*97*		*73 - 120*		*11/17/21 19:01*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159719-1

Client Sample ID: MW-110S_110821

Date Collected: 11/08/21 15:16
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159719-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 03:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*66 - 120*		*11/18/21 03:37*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 19:23	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 19:23	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 19:23	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 19:23	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 19:23	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 19:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*62 - 137*		*11/17/21 19:23*	*1*
4-Bromofluorobenzene (Surr)	*65*		*56 - 136*		*11/17/21 19:23*	*1*
Toluene-d8 (Surr)	*87*		*78 - 122*		*11/17/21 19:23*	*1*
Dibromofluoromethane (Surr)	*105*		*73 - 120*		*11/17/21 19:23*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159719-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159719-1	TRIP BLANK_90	115	71	85	97
240-159719-2	MW-110S_110821	116	65	87	105
240-159724-A-2 MS	Matrix Spike	96	99	103	84
240-159724-C-2 MSD	Matrix Spike Duplicate	97	97	106	86
LCS 240-513417/4	Lab Control Sample	93	97	98	84
MB 240-513417/7	Method Blank	105	76	89	91

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159636-H-2 MS	Matrix Spike	77
240-159636-N-2 MSD	Matrix Spike Duplicate	77
240-159719-2	MW-110S_110821	79
LCS 240-513479/4	Lab Control Sample	78
MB 240-513479/5	Method Blank	77

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513417/7
Matrix: Water
Analysis Batch: 513417

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 13:33	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 13:33	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 13:33	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 13:33	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 13:33	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 13:33	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/17/21 13:33*	*1*
4-Bromofluorobenzene (Surr)	*76*		*56 - 136*		*11/17/21 13:33*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/17/21 13:33*	*1*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*11/17/21 13:33*	*1*

Lab Sample ID: LCS 240-513417/4
Matrix: Water
Analysis Batch: 513417

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.24		ug/L		92	63 - 134
cis-1,2-Dichloroethene	10.0	9.72		ug/L		97	77 - 123
Tetrachloroethene	10.0	9.53		ug/L		95	76 - 123
trans-1,2-Dichloroethene	10.0	10.1		ug/L		101	75 - 124
Trichloroethene	10.0	8.80		ug/L		88	70 - 122
Vinyl chloride	10.0	11.6		ug/L		116	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*97*		*56 - 136*
Toluene-d8 (Surr)	*98*		*78 - 122*
Dibromofluoromethane (Surr)	*84*		*73 - 120*

Lab Sample ID: 240-159724-A-2 MS
Matrix: Water
Analysis Batch: 513417

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	8.39		ug/L		84	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	8.85		ug/L		88	66 - 128
Tetrachloroethene	1.0	U	10.0	8.96		ug/L		90	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.58		ug/L		96	56 - 136
Trichloroethene	1.0	U	10.0	7.89		ug/L		79	61 - 124
Vinyl chloride	2.8		10.0	14.2		ug/L		114	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*
4-Bromofluorobenzene (Surr)	*99*		*56 - 136*
Toluene-d8 (Surr)	*103*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159724-A-2 MS
Matrix: Water
Analysis Batch: 513417

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*84*		*73 - 120*

Lab Sample ID: 240-159724-C-2 MSD
Matrix: Water
Analysis Batch: 513417

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	7.80		ug/L		78	56 - 135	7	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.45		ug/L		95	66 - 128	7	14
Tetrachloroethene	1.0	U	10.0	9.27		ug/L		93	62 - 131	3	20
trans-1,2-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	56 - 136	8	15
Trichloroethene	1.0	U	10.0	8.32		ug/L		83	61 - 124	5	15
Vinyl chloride	2.8		10.0	15.8		ug/L		130	43 - 157	11	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*62 - 137*
4-Bromofluorobenzene (Surr)	*97*		*56 - 136*
Toluene-d8 (Surr)	*106*		*78 - 122*
Dibromofluoromethane (Surr)	*86*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513479/5
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 17:41	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*		*11/17/21 17:41*	*1*

Lab Sample ID: LCS 240-513479/4
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	11.9		ug/L		119	80 - 122		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*

Lab Sample ID: 240-159636-H-2 MS
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153		

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

Lab Sample ID: 240-159636-N-2 MSD
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153	0	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159719-1

GC/MS VOA

Analysis Batch: 513417

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159719-1	TRIP BLANK_90	Total/NA	Water	8260B	
240-159719-2	MW-110S_110821	Total/NA	Water	8260B	
MB 240-513417/7	Method Blank	Total/NA	Water	8260B	
LCS 240-513417/4	Lab Control Sample	Total/NA	Water	8260B	
240-159724-A-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159724-C-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 513479

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159719-2	MW-110S_110821	Total/NA	Water	8260B SIM	
MB 240-513479/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513479/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159636-H-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159636-N-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159719-1

Client Sample ID: TRIP BLANK_90

Lab Sample ID: 240-159719-1

Date Collected: 11/08/21 00:00

Matrix: Water

Date Received: 11/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513417	11/17/21 19:01	LEE	TAL CAN

Client Sample ID: MW-110S_110821

Lab Sample ID: 240-159719-2

Date Collected: 11/08/21 15:16

Matrix: Water

Date Received: 11/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513417	11/17/21 19:23	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513479	11/18/21 03:37	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159719-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	For lab use only
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		Walk-in client
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day (10 day)		Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30080642.402.04	Shipping/Tracking No:			
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM				Sample Specific Notes / Special Instructions:
TRIP BLANK_90	---	---		X						1					N	G	X	X	X	X	X	X	~~X~~ (rev)				1 Trip Blank
MW-1105_110821	11/08/21	1516		X						6					N	G	X	X	X	X	X	X	X				3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159719 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	11/08/21 1635	Novi cold storage	Arcadis	11/08/21 1635
[illegible]	ARCADIS	11/9/21 1040	[illegible]	ETA	11/9/21 1040
Lori Hall	ETA	11/9/21 1055	Mandolyn Block	ETA	11-10-21 8:00

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159719**
Canton Facility

Client Arcadis Site Name

Cooler Received on 11/10/21 Opened on 11/10/21

Cooler unpacked by: Mandy Block

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity_____	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC157842
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #_____	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

M.B 11-10-21

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

No SIM on TB per Corrected COC. DMR 11/10/21

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

Login # : 159719

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form				
Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
TA Client Box Other	IR-14 IR-15	0.6	0.7	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15	0.7	0.8	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15	

DATA VERIFICATION REPORT

November 25, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159719-1
Sample date: 2021-11-08
Report received by CADENA: 2021-11-24
Initial Data Verification completed by CADENA: 2021-11-25
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159719-1

		Sample Name:	TRIP BLANK_90				MW-110S_110821			
		Lab Sample ID:	2401597191				2401597192			
		Sample Date:	11/8/2021				11/8/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

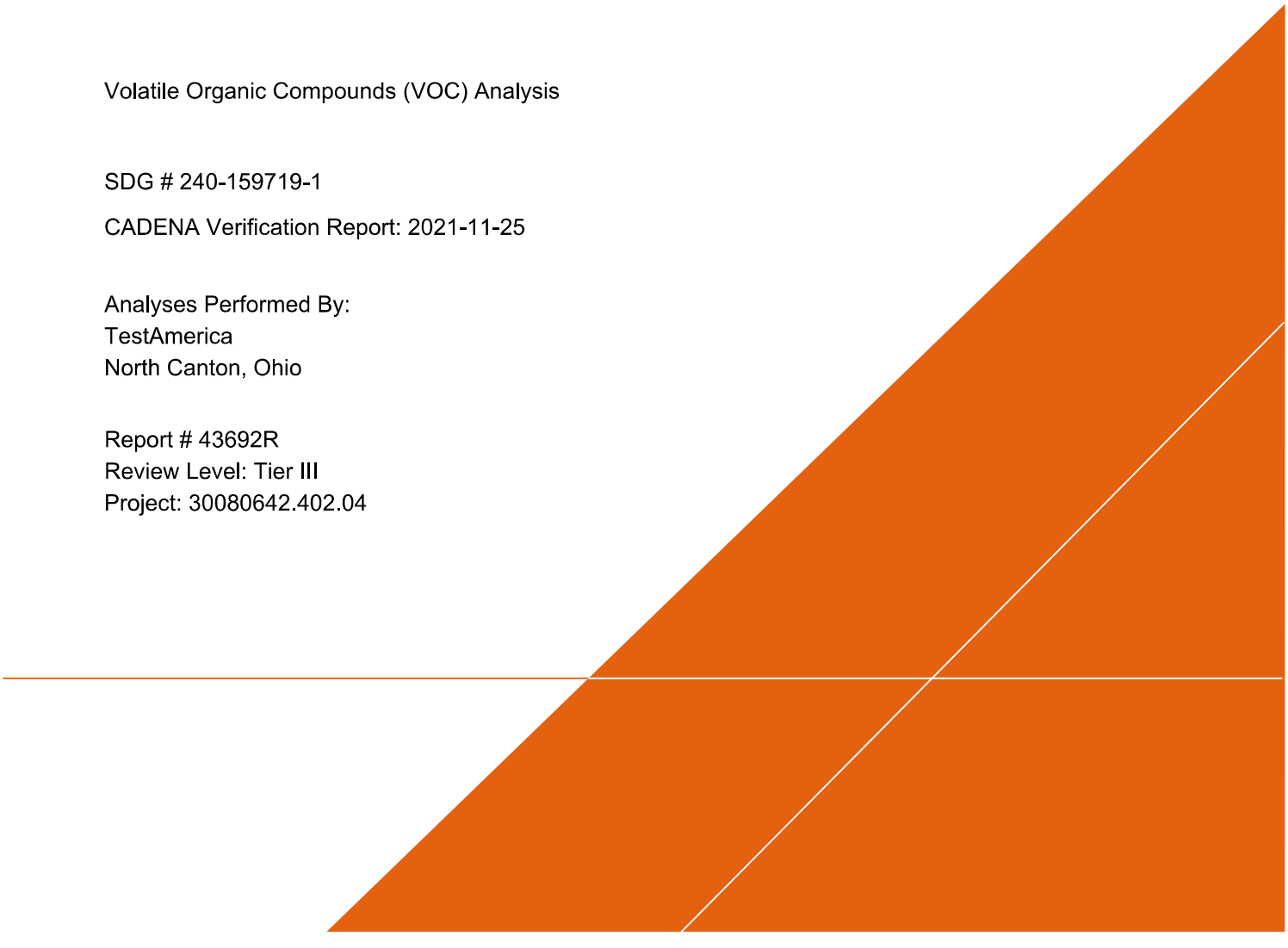
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159719-1

CADENA Verification Report: 2021-11-25

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43692R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159719-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_90	240-159719-1	Water	11/08/21		X	
MW-110S_110821	240-159719-2	Water	11/08/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 13, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day — 10 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM				Sample Specific Notes / Special Instructions:
TRIP BLANK_ 90	---	---		X						1					N	G	X	X	X	X	X	X	X (Rev)				1 Trip Blank
MW-1105_110821	11/08/21	1516		X						6					N	G	X	X	X	X	X	X	X				3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159719 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time	
Relinquished by: Gary Schafer	Arcadis	11/08/21	1635	Received by: Nov. cold Storage	Arcadis	11/08/21 1655
Relinquished by: [illegible]	ARCADIS	11/9/21	1040	Received by: Jeri Hall	ETA	11/9/21 1040
Relinquished by: Jeri Hall	ETA	11/9/21	1055	Received in Laboratory by: Mandaly Block	ETA	11-10-21 8:00

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11/24/2021

Client Sample ID: TRIP BLANK_90 — Lab Sample ID: 240-159719-1

Date Collected: 11/08/21 00:00 — **Matrix: Water**
Date Received: 11/10/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 19:01	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 19:01	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 19:01	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 19:01	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 19:01	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 19:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*115*		*62 - 137*		*11/17/21 19:01*	*1*
4-Bromofluorobenzene (Surr)	*71*		*56 - 136*		*11/17/21 19:01*	*1*
Toluene-d8 (Surr)	*85*		*78 - 122*		*11/17/21 19:01*	*1*
Dibromofluoromethane (Surr)	*97*		*73 - 120*		*11/17/21 19:01*	*1*

Client Sample ID: MW-110S_110821 — Lab Sample ID: 240-159719-2

Date Collected: 11/08/21 15:16 — **Matrix: Water**
Date Received: 11/10/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 03:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*66 - 120*		*11/18/21 03:37*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 19:23	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 19:23	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 19:23	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 19:23	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 19:23	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 19:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*62 - 137*		*11/17/21 19:23*	*1*
4-Bromofluorobenzene (Surr)	*65*		*56 - 136*		*11/17/21 19:23*	*1*
Toluene-d8 (Surr)	*87*		*78 - 122*		*11/17/21 19:23*	*1*
Dibromofluoromethane (Surr)	*105*		*73 - 120*		*11/17/21 19:23*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159507-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/22/2021 7:50:04 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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Have a Question? Ask The Expert

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159507-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159507-1

Job ID: 240-159507-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159507-1

Comments
No additional comments.

Receipt
The samples were received on 11/6/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.1º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159507-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159507-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159507-1	TRIP BLANK_09	Water	11/03/21 00:00	11/06/21 08:00
240-159507-2	MW-161S_110321	Water	11/03/21 09:05	11/06/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159507-1

Client Sample ID: TRIP BLANK_09 — Lab Sample ID: 240-159507-1

No Detections.

Client Sample ID: MW-161S_110321 — Lab Sample ID: 240-159507-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159507-1

Client Sample ID: TRIP BLANK_09

Date Collected: 11/03/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159507-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 20:15	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 20:15	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 20:15	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 20:15	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 20:15	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 20:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*62 - 137*		*11/13/21 20:15*	*1*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*		*11/13/21 20:15*	*1*
Toluene-d8 (Surr)	*110*		*78 - 122*		*11/13/21 20:15*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*11/13/21 20:15*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159507-1

Client Sample ID: MW-161S_110321
Date Collected: 11/03/21 09:05
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159507-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 00:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*		*11/12/21 00:14*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 20:37	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 20:37	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 20:37	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 20:37	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 20:37	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 20:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*11/13/21 20:37*	*1*
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*11/13/21 20:37*	*1*
Toluene-d8 (Surr)	*107*		*78 - 122*		*11/13/21 20:37*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/13/21 20:37*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159507-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159418-E-2 MS	Matrix Spike	93	87	106	94
240-159418-L-2 MSD	Matrix Spike Duplicate	90	87	107	91
240-159507-1	TRIP BLANK_09	97	78	110	95
240-159507-2	MW-161S_110321	96	73	107	96
LCS 240-512817/4	Lab Control Sample	90	89	112	90
MB 240-512817/6	Method Blank	98	81	112	98

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159418-H-2 MS	Matrix Spike	82
240-159418-P-2 MSD	Matrix Spike Duplicate	83
240-159507-2	MW-161S_110321	81
LCS 240-512585/4	Lab Control Sample	81
MB 240-512585/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512817/6
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 13:55	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 13:55	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:55	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 13:55	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:55	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 13:55	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*		*11/13/21 13:55*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/13/21 13:55*	*1*
Toluene-d8 (Surr)	*112*		*78 - 122*		*11/13/21 13:55*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/13/21 13:55*	*1*

Lab Sample ID: LCS 240-512817/4
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.9		ug/L		109	63 - 134
cis-1,2-Dichloroethene	10.0	10.3		ug/L		103	77 - 123
Tetrachloroethene	10.0	11.9		ug/L		119	76 - 123
trans-1,2-Dichloroethene	10.0	10.8		ug/L		108	75 - 124
Trichloroethene	10.0	9.19		ug/L		92	70 - 122
Vinyl chloride	10.0	9.48		ug/L		95	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*89*		*56 - 136*
Toluene-d8 (Surr)	*112*		*78 - 122*
Dibromofluoromethane (Surr)	*90*		*73 - 120*

Lab Sample ID: 240-159418-E-2 MS
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	10.3		ug/L		103	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.89		ug/L		99	66 - 128
Tetrachloroethene	1.0	U	10.0	9.53		ug/L		95	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.91		ug/L		99	56 - 136
Trichloroethene	1.0	U	10.0	8.16		ug/L		82	61 - 124
Vinyl chloride	1.0	U	10.0	9.96		ug/L		100	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*106*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159418-E-2 MS
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: 240-159418-L-2 MSD
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	10.0		ug/L		100	56 - 135	2	26
cis-1,2-Dichloroethene	1.0	U	10.0	10.1		ug/L		101	66 - 128	2	14
Tetrachloroethene	1.0	U	10.0	10.1		ug/L		101	62 - 131	5	20
trans-1,2-Dichloroethene	1.0	U	10.0	10.1		ug/L		101	56 - 136	2	15
Trichloroethene	1.0	U	10.0	8.61		ug/L		86	61 - 124	5	15
Vinyl chloride	1.0	U	10.0	10.2		ug/L		102	43 - 157	3	24

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*107*		*78 - 122*
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512585/5
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/11/21 19:04	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/11/21 19:04*	*1*

Lab Sample ID: LCS 240-512585/4
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.86		ug/L		99	80 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*

Lab Sample ID: 240-159418-H-2 MS
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	11.1		ug/L		111	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159418-P-2 MSD
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.2		ug/L		102	51 - 153	8	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159507-1

GC/MS VOA

Analysis Batch: 512585

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159507-2	MW-161S_110321	Total/NA	Water	8260B SIM	
MB 240-512585/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512585/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159418-H-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159418-P-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 512817

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159507-1	TRIP BLANK_09	Total/NA	Water	8260B	
240-159507-2	MW-161S_110321	Total/NA	Water	8260B	
MB 240-512817/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512817/4	Lab Control Sample	Total/NA	Water	8260B	
240-159418-E-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159418-L-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159507-1

Client Sample ID: TRIP BLANK_09

Lab Sample ID: 240-159507-1

Date Collected: 11/03/21 00:00

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512817	11/13/21 20:15	LEE	TAL CAN

Client Sample ID: MW-161S_110321

Lab Sample ID: 240-159507-2

Date Collected: 11/03/21 09:05

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512817	11/13/21 20:37	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512585	11/12/21 00:14	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159507-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Sean Turner		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30080642.402.04	Shipping/Tracking No:		
PO # 30080642.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below

10 day

3 weeks
2 weeks
1 week
2 days
1 day

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM					Sample Specific Notes / Special Instructions:
TRIP BLANK_ 09	—	—		X						1					N	G	X	X	X	X	X	X	X					1 Trip Blank
MW-161S_110321	11/3/21	105		X						6					N	G	X	X	X	X	X	X	X					3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159507 Chain of Custody

Possible Hazard Identification
Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Return to Client Disposal By Lab Archive For Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
S. Turner	Arcadis	11/4/21 / 1500	Novi cold storage	Arcadis	11/4/21 1500
Christa Mun	ARCADIS	11/5/21 / 1435	Jeri Hae	ETA	11/5/21 1435
Jeri Hae	ETA	11/5/21 1448	M.A.A.	ETA	11/6/21 8:00

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 159507

Client ARCADIS Site Name _____

Cooler Received on 11/6/21 Opened on 11/6/21

Cooler unpacked by: Matthew Surma

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 1.0 °C Corrected Cooler Temp. 1.1 °C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
& Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# **HC157842**
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 0104201G	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	(No)

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

WI-NC-099

DATA VERIFICATION REPORT

November 22, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159507-1
Sample date: 2021-11-03
Report received by CADENA: 2021-11-22
Initial Data Verification completed by CADENA: 2021-11-22
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159507-1

		Sample Name:	TRIP BLANK_09				MW-161S_110321			
		Lab Sample ID:	2401595071				2401595072			
		Sample Date:	11/3/2021				11/3/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

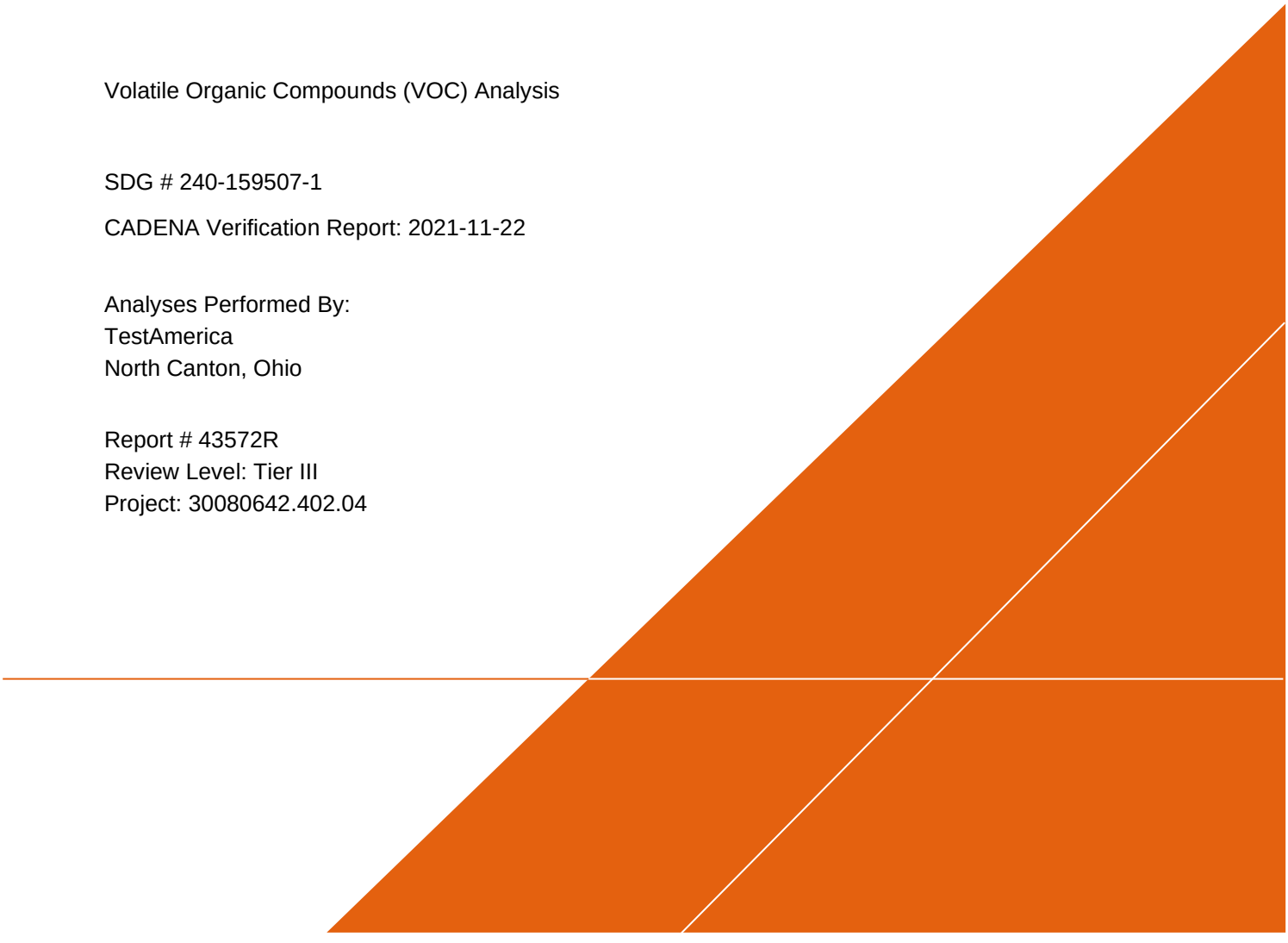
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159507-1

CADENA Verification Report: 2021-11-22

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43572R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159507-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_09	240-159507-1	Water	11/03/21		X	
MW-161S_110321	240-159507-2	Water	11/03/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE:

DATE: December 07, 2021

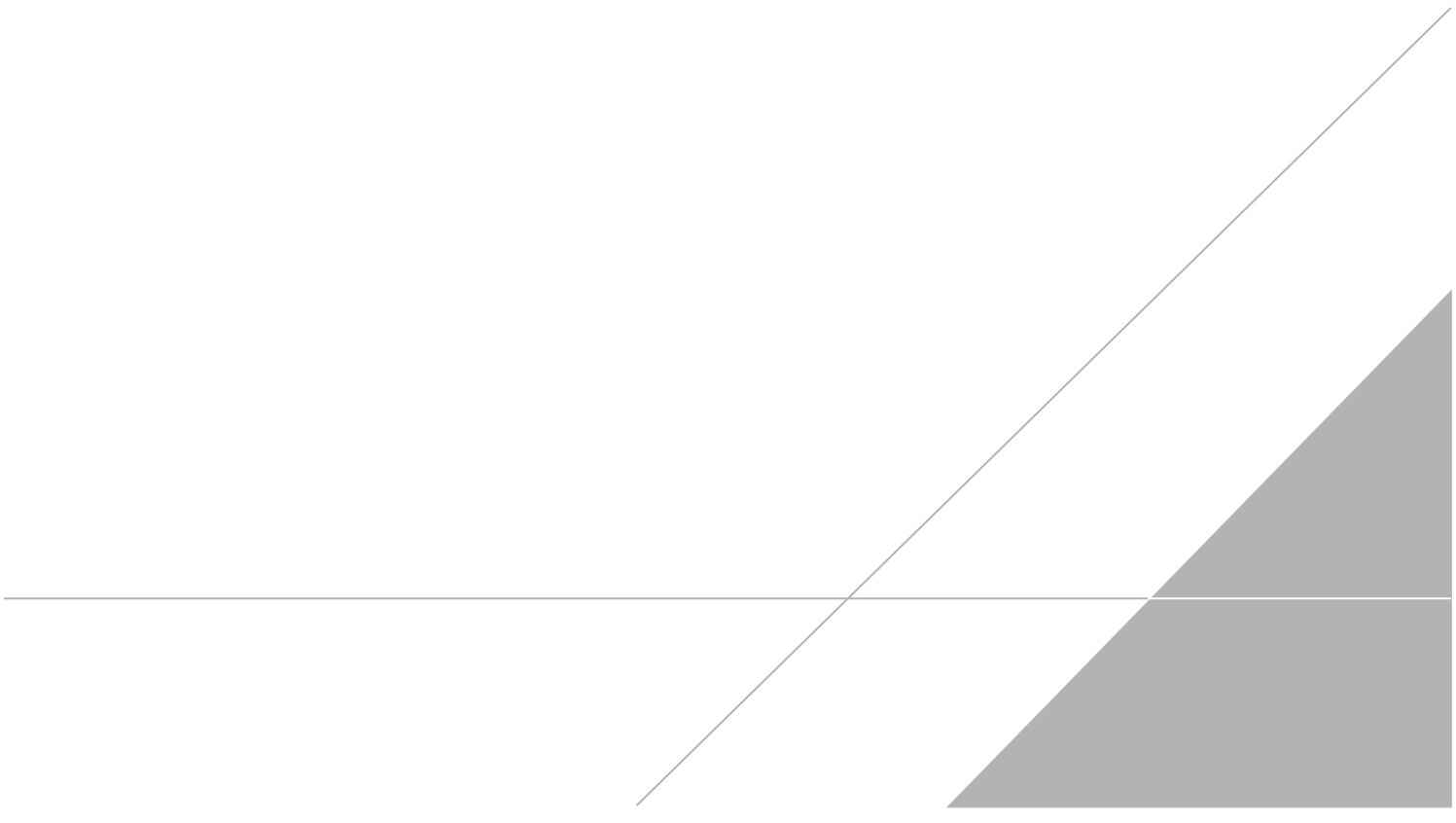
PEER REVIEW: Andrew Korycinski

DATE: December 8, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



MICHIGAN 190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No: 1 of 1 COCs
Phone: 248-994-2240	Sampler Name: Sam Turner	TAT if different from below	For lab use only
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:	10 day ☑ 2 weeks ☐ 3 weeks ☐ 1 week ☐ 2 days ☐ 1 day	Walk-in client
Project Number: 30080642.402.04	Shipping/Tracking No:		Lab sampling
PO # 30080642.402.04			Job/SDG No:

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_09	—	—		X						1					N	G	X	X	X	X	X	X	X (w)	1 Trip Blank
MW-16S_110321	11/3/21	905		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159507 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Sam Turner	Arcadis	11/4/21 / 1500	Novi cold storage	Arcadis	11/4/21 1500
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Christa Mun	ARCADIS	11/5/21 / 1435	Jeri Hall	ETA	11/5/21 1435
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
Jeri Hall	ETA	11/5/21 1448	M.A.A.	ETA	11/6/21 8:00

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11/22/2021

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159507-1

Client Sample ID: TRIP BLANK_09

Date Collected: 11/03/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159507-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 20:15	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 20:15	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 20:15	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 20:15	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 20:15	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 20:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*62 - 137*		*11/13/21 20:15*	*1*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*		*11/13/21 20:15*	*1*
Toluene-d8 (Surr)	*110*		*78 - 122*		*11/13/21 20:15*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*11/13/21 20:15*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159507-1

Client Sample ID: MW-161S_110321
Date Collected: 11/03/21 09:05
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159507-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 00:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*		*11/12/21 00:14*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 20:37	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 20:37	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 20:37	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 20:37	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 20:37	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 20:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*11/13/21 20:37*	*1*
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*11/13/21 20:37*	*1*
Toluene-d8 (Surr)	*107*		*78 - 122*		*11/13/21 20:37*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/13/21 20:37*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159967-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/29/2021 8:46:15 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at:
www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159967-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159967-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159967-1

Comments
No additional comments.

Receipt
The samples were received on 11/12/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.6° C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) associated with batch 513962 recovered above the upper control limit for Vinyl Chloride. The samples associated with this CCV were non-detect for the affected analyte; therefore, the data have been reported. The associated samples are impacted: TRIP BLANK_84 (240-159967-1), MW-116S_111021 (240-159967-2) and MW-216S_111021 (240-159967-3).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159967-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159967-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159967-1	TRIP BLANK_84	Water	11/10/21 00:00	11/12/21 08:00
240-159967-2	MW-116S_111021	Water	11/10/21 10:45	11/12/21 08:00
240-159967-3	MW-216S_111021	Water	11/10/21 12:00	11/12/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159967-1

Client Sample ID: TRIP BLANK_84 — Lab Sample ID: 240-159967-1

No Detections.

Client Sample ID: MW-116S_111021 — Lab Sample ID: 240-159967-2

No Detections.

Client Sample ID: MW-216S_111021 — Lab Sample ID: 240-159967-3

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159967-1

Client Sample ID: TRIP BLANK_84
Date Collected: 11/10/21 00:00
Date Received: 11/12/21 08:00

Lab Sample ID: 240-159967-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 19:58	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 19:58	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 19:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 19:58	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 19:58	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 19:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/20/21 19:58*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/20/21 19:58*	*1*
Toluene-d8 (Surr)	*102*		*78 - 122*		*11/20/21 19:58*	*1*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*11/20/21 19:58*	*1*

Client Sample ID: MW-116S_111021

Date Collected: 11/10/21 10:45
Date Received: 11/12/21 08:00

Lab Sample ID: 240-159967-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 06:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*66 - 120*		*11/18/21 06:20*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 20:21	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 20:21	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 20:21	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 20:21	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 20:21	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 20:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*62 - 137*		*11/20/21 20:21*	*1*
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*11/20/21 20:21*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/20/21 20:21*	*1*
Dibromofluoromethane (Surr)	*97*		*73 - 120*		*11/20/21 20:21*	*1*

Client Sample ID: MW-216S_111021

Date Collected: 11/10/21 12:00
Date Received: 11/12/21 08:00

Lab Sample ID: 240-159967-3

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 21:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*76*		*66 - 120*		*11/18/21 21:45*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 20:43	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 20:43	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 20:43	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 20:43	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 20:43	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 20:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/20/21 20:43*	*1*
4-Bromofluorobenzene (Surr)	*74*		*56 - 136*		*11/20/21 20:43*	*1*
Toluene-d8 (Surr)	*115*		*78 - 122*		*11/20/21 20:43*	*1*
Dibromofluoromethane (Surr)	*97*		*73 - 120*		*11/20/21 20:43*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159967-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159967-1	TRIP BLANK_84	99	70	102	91
240-159967-2	MW-116S_111021	106	73	108	97
240-159967-3	MW-216S_111021	105	74	115	97
240-160095-B-1 MS	Matrix Spike	96	84	113	91
240-160095-B-1 MSD	Matrix Spike Duplicate	95	85	103	88
LCS 240-513962/4	Lab Control Sample	97	79	113	93
MB 240-513962/6	Method Blank	103	76	112	94

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159642-H-3 MS	Matrix Spike	87
240-159642-M-3 MSD	Matrix Spike Duplicate	87
240-159739-G-3 MS	Matrix Spike	74
240-159739-M-3 MSD	Matrix Spike Duplicate	75
240-159967-2	MW-116S_111021	88
240-159967-3	MW-216S_111021	76
LCS 240-513480/3	Lab Control Sample	84
LCS 240-513700/4	Lab Control Sample	75
MB 240-513480/4	Method Blank	84
MB 240-513700/5	Method Blank	77

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513962/6
Matrix: Water
Analysis Batch: 513962

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 15:30	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 15:30	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 15:30	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 15:30	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 15:30	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 15:30	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*		*11/20/21 15:30*	*1*
4-Bromofluorobenzene (Surr)	*76*		*56 - 136*		*11/20/21 15:30*	*1*
Toluene-d8 (Surr)	*112*		*78 - 122*		*11/20/21 15:30*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/20/21 15:30*	*1*

Lab Sample ID: LCS 240-513962/4
Matrix: Water
Analysis Batch: 513962

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.62		ug/L		96	63 - 134
cis-1,2-Dichloroethene	10.0	10.4		ug/L		104	77 - 123
Tetrachloroethene	10.0	10.5		ug/L		105	76 - 123
trans-1,2-Dichloroethene	10.0	10.2		ug/L		102	75 - 124
Trichloroethene	10.0	8.81		ug/L		88	70 - 122
Vinyl chloride	10.0	10.0		ug/L		100	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*62 - 137*
4-Bromofluorobenzene (Surr)	*79*		*56 - 136*
Toluene-d8 (Surr)	*113*		*78 - 122*
Dibromofluoromethane (Surr)	*93*		*73 - 120*

Lab Sample ID: 240-160095-B-1 MS
Matrix: Water
Analysis Batch: 513962

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	50	U	500	457		ug/L		91	56 - 135
cis-1,2-Dichloroethene	50	U	500	478		ug/L		96	66 - 128
Tetrachloroethene	50	U	500	451		ug/L		90	62 - 131
trans-1,2-Dichloroethene	50	U	500	477		ug/L		95	56 - 136
Trichloroethene	50	U	500	396		ug/L		79	61 - 124
Vinyl chloride	50	U	500	476		ug/L		95	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*
Toluene-d8 (Surr)	*113*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-160095-B-1 MS
Matrix: Water
Analysis Batch: 513962

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Lab Sample ID: 240-160095-B-1 MSD
Matrix: Water
Analysis Batch: 513962

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	50	U	500	486		ug/L		97	56 - 135	6	26
cis-1,2-Dichloroethene	50	U	500	481		ug/L		96	66 - 128	1	14
Tetrachloroethene	50	U	500	459		ug/L		92	62 - 131	2	20
trans-1,2-Dichloroethene	50	U	500	487		ug/L		97	56 - 136	2	15
Trichloroethene	50	U	500	399		ug/L		80	61 - 124	1	15
Vinyl chloride	50	U	500	504		ug/L		101	43 - 157	6	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*95*		*62 - 137*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*
Toluene-d8 (Surr)	*103*		*78 - 122*
Dibromofluoromethane (Surr)	*88*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513480/4
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 19:58	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/17/21 19:58*	*1*

Lab Sample ID: LCS 240-513480/3
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.37		ug/L		94	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*

Lab Sample ID: 240-159642-H-3 MS
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.3		ug/L		103	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

Lab Sample ID: 240-159642-M-3 MSD
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.57		ug/L		96	51 - 153	7	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

Lab Sample ID: MB 240-513700/5
Matrix: Water
Analysis Batch: 513700

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 19:41	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*		*11/18/21 19:41*	*1*

Lab Sample ID: LCS 240-513700/4
Matrix: Water
Analysis Batch: 513700

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.4		ug/L		104	80 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*

Lab Sample ID: 240-159739-G-3 MS
Matrix: Water
Analysis Batch: 513700

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.4		ug/L		104	51 - 153

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*74*		*66 - 120*

Lab Sample ID: 240-159739-M-3 MSD
Matrix: Water
Analysis Batch: 513700

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153	2	16

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159739-M-3 MSD
Matrix: Water
Analysis Batch: 513700

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159967-1

GC/MS VOA

Analysis Batch: 513480

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159967-2	MW-116S_111021	Total/NA	Water	8260B SIM	
MB 240-513480/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513480/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159642-H-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159642-M-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513700

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159967-3	MW-216S_111021	Total/NA	Water	8260B SIM	
MB 240-513700/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513700/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159739-G-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159739-M-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513962

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159967-1	TRIP BLANK_84	Total/NA	Water	8260B	
240-159967-2	MW-116S_111021	Total/NA	Water	8260B	
240-159967-3	MW-216S_111021	Total/NA	Water	8260B	
MB 240-513962/6	Method Blank	Total/NA	Water	8260B	
LCS 240-513962/4	Lab Control Sample	Total/NA	Water	8260B	
240-160095-B-1 MS	Matrix Spike	Total/NA	Water	8260B	
240-160095-B-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159967-1

Client Sample ID: TRIP BLANK_84

Lab Sample ID: 240-159967-1

Date Collected: 11/10/21 00:00
Matrix: Water
Date Received: 11/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513962	11/20/21 19:58	LEE	TAL CAN

Client Sample ID: MW-116S_111021

Lab Sample ID: 240-159967-2

Date Collected: 11/10/21 10:45
Matrix: Water
Date Received: 11/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513962	11/20/21 20:21	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513480	11/18/21 06:20	CS	TAL CAN

Client Sample ID: MW-216S_111021

Lab Sample ID: 240-159967-3

Date Collected: 11/10/21 12:00
Matrix: Water
Date Received: 11/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513962	11/20/21 20:43	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513700	11/18/21 21:45	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159967-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton – 10449 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2769

Regulatory program: DW NPDES RCRA Other

Client Contact	Project Manager: Kris Bowers	Site Contact: John McCaffrey	Lab Contact: Mike DeMarco	TestAmerica Laboratories, Inc.
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-844-5131	Telephone: 330-497-9396	COC No:
Address: 28550 Cabot Drive, Suite 500	Email: kris.bowers@arcadis-us.com	Analysis Turnaround Time		1 of 1 COC
City/State/Zip: Novi, MI, 48377	Sampler Name:	TAT (Check one box)		For lab use only
Phone: 248-994-2240	Method of Shipment/Carrier:	10 day / 3 weeks / 2 weeks / 1 week / 2 days / 1 day		Walk-in client
Project Name: Fort LTP Off-Site	Shipping/Tracking No:			Lab sampling
Project Number: 30050642.402.04				Job/SDG No.
PO # 30050642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air / Aqueous / Sediment / Solid / Other	Containers & Preservatives: HNO3 / H2SO4 / HCl / NaOH / ZnAc / NaHSO4 / Other	Filtered Sample (Y / N)	Composite (C) / Grab (G)	Analyses: TCL-VOC 8260B / cis-1,2-DCE 8260B / Trans-1,2-DCE 8260B / PCE 8260B / TCE 8260B / Vinyl Chloride 8260B / 1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions
TRIP BLANK_04	—	—	X	4	N	G	X X X X X X X	1 Trip Blank
								3 VOAs for 8260B
								3 VOAs for 8260B SIM

240-159967 Chain of Custody

Possible Hazard Identification: Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / Disposal By Lab / Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena (cadena@arcadis.com, Cadena #225161)
Level II+ (Reported requested)

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company: ARCADIS	Date/Time: 11/10/21 1550	Received by:	Company:	Date/Time: 11/10/21 1552
Relinquished by:	Company: ETA	Date/Time: 11-11-21 1046	Received in Laboratory by:	Company: ETA	Date/Time: 11/12/21 8:40

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159967**
Canton Facility

Client Arcadis Site Name

Cooler Received on 11/12/21 Opened on 11/12/21

Cooler unpacked by: Matthew Surma

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp 0.5 °C Corrected Cooler Temp. 0.6 °C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2 Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No M.S.S.
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No	(NA) pH Strip Lot# HC157842
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ____	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

NO SIM on TB per Corrected COC. DMR 11/12/21

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.

Sample(s) ____ were received in a broken container.

Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.

Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

November 29, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159967-1
Sample date: 2021-11-10
Report received by CADENA: 2021-11-29
Initial Data Verification completed by CADENA: 2021-11-29
Number of Samples:3
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch CCV response outliers as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159967-1

		Sample Name:	TRIP BLANK_84				MW-116S_111021				MW-216S_111021			
		Lab Sample ID:	2401599671				2401599672				2401599673			
		Sample Date:	11/10/2021				11/10/2021				11/10/2021			
Analyte	Cas No.		Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC														
OSW-8260B														
1,1-Dichloroethene	75-35-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim														
1,4-Dioxane	123-91-1						ND	2.0	ug/l	---	ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

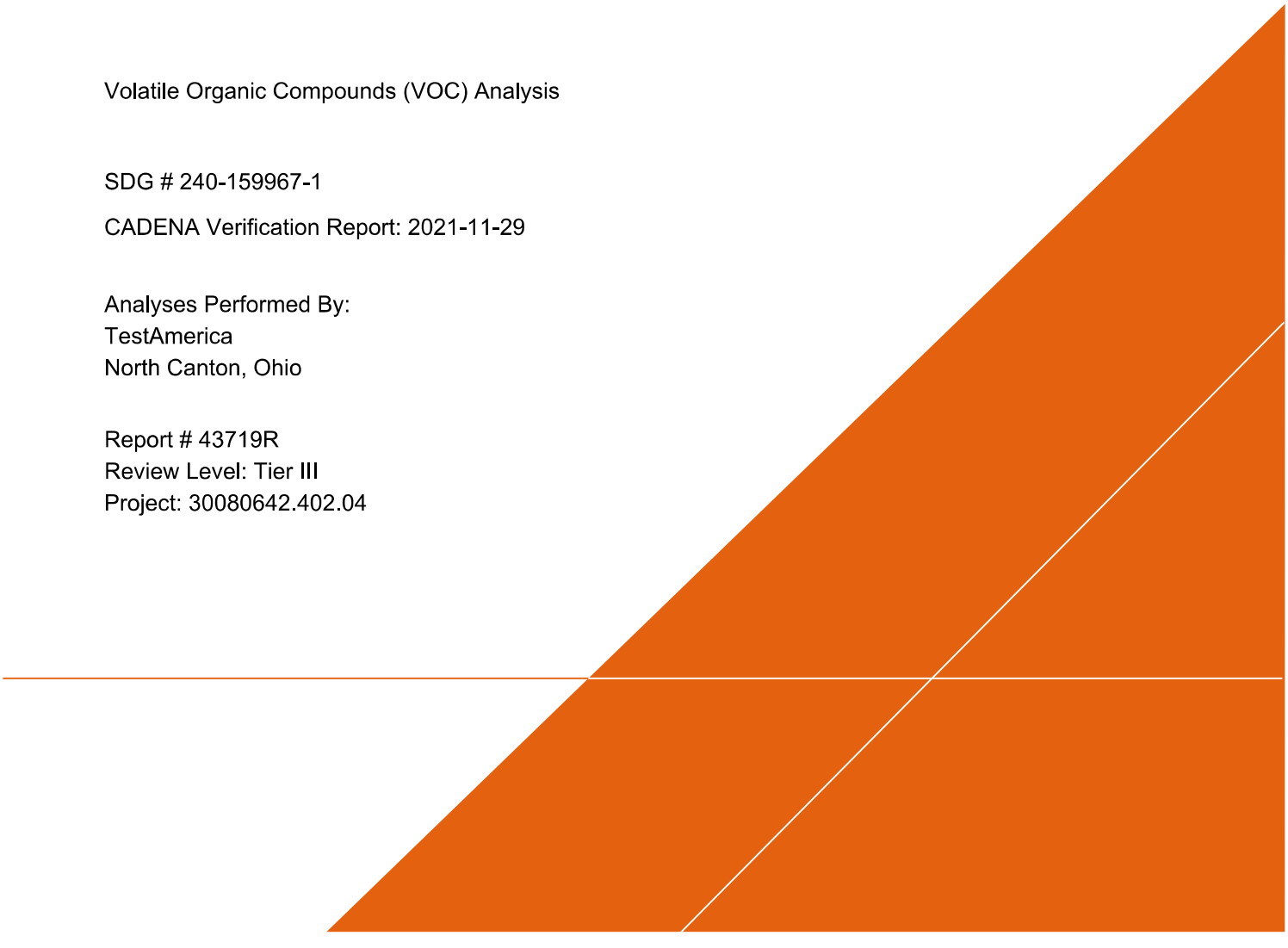
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159967-1

CADENA Verification Report: 2021-11-29

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43719R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159967-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_84	240-159967-1	Water	11/10/21		X	
MW-116S_111021	240-159967-2	Water	11/10/21		X	X
MW-216S_111021	240-159967-3	Water	11/10/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Compound	Criteria
TRIP BLANK_84 MW-116S_111021 MW-216S_111021	Continuous Calibration Verification %D	Vinyl chloride	+22.0%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action

Initial/Continuing	Criteria	Sample Result	Qualification
		Detect	
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN
30

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: — DW — NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Sam Turner	TAT if different from below: 10 day ✓ 3 weeks / 2 weeks / 1 week / 2 days / 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_84	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-116S_111021	11/10/21	1045		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW 216S_111021	11/10/21	1200		X						6					N	G	X	X	X	X	X	X	X	1

240-159967 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard — Flammable — Skin Irritant — Poison B — Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client — ✓ Disposal ByLab — Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com Cadena #E203631
Level IV Reporting requested

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Sam Turner	Arcadis	11/10/21/1330	Novi Cold Storage	Arcadis	11/10/21/1330
[illegible]	ARCADIS	11/11/21 0950	Jen Hale	ETA	11/11/21 0950
Jen Hale	ETA	11-11-21 1046	Received in Laboratory by: M.A.	Company: ETA	Date/Time: 11/12/21 8:00

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11/29/2021

Client Sample ID: TRIP BLANK_84 — Lab Sample ID: 240-159967-1

Date Collected: 11/10/21 00:00 — **Matrix: Water**
Date Received: 11/12/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 19:58	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 19:58	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 19:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 19:58	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 19:58	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 19:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/20/21 19:58*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/20/21 19:58*	*1*
Toluene-d8 (Surr)	*102*		*78 - 122*		*11/20/21 19:58*	*1*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*11/20/21 19:58*	*1*

Client Sample ID: MW-116S_111021 — Lab Sample ID: 240-159967-2

Date Collected: 11/10/21 10:45 — **Matrix: Water**
Date Received: 11/12/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 06:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*66 - 120*		*11/18/21 06:20*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 20:21	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 20:21	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 20:21	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 20:21	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 20:21	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 20:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*62 - 137*		*11/20/21 20:21*	*1*
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*11/20/21 20:21*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/20/21 20:21*	*1*
Dibromofluoromethane (Surr)	*97*		*73 - 120*		*11/20/21 20:21*	*1*

Client Sample ID: MW-216S_111021 — Lab Sample ID: 240-159967-3

Date Collected: 11/10/21 12:00 — **Matrix: Water**
Date Received: 11/12/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 21:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*76*		*66 - 120*		*11/18/21 21:45*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159967-1

Client Sample ID: MW-216S_111021

Date Collected: 11/10/21 12:00
Date Received: 11/12/21 08:00

Lab Sample ID: 240-159967-3

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 20:43	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 20:43	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 20:43	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 20:43	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 20:43	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 20:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/20/21 20:43*	*1*
4-Bromofluorobenzene (Surr)	*74*		*56 - 136*		*11/20/21 20:43*	*1*
Toluene-d8 (Surr)	*115*		*78 - 122*		*11/20/21 20:43*	*1*
Dibromofluoromethane (Surr)	*97*		*73 - 120*		*11/20/21 20:43*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159818-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/26/2021 7:44:53 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159818-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159818-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159818-1

Comments
No additional comments.

Receipt
The samples were received on 11/11/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 4.6° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159818-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159818-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159818-1	TRIP BLANK_61	Water	11/09/21 00:00	11/11/21 08:00
240-159818-2	MW-179S_110921	Water	11/09/21 10:05	11/11/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159818-1

Client Sample ID: TRIP BLANK_61 — Lab Sample ID: 240-159818-1

No Detections.

Client Sample ID: MW-179S_110921 — Lab Sample ID: 240-159818-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159818-1

Client Sample ID: TRIP BLANK_61
Date Collected: 11/09/21 00:00
Date Received: 11/11/21 08:00

Lab Sample ID: 240-159818-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 03:05	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 03:05	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 03:05	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 03:05	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 03:05	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 03:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*62 - 137*		*11/19/21 03:05*	*1*
4-Bromofluorobenzene (Surr)	*76*		*56 - 136*		*11/19/21 03:05*	*1*
Toluene-d8 (Surr)	*103*		*78 - 122*		*11/19/21 03:05*	*1*
Dibromofluoromethane (Surr)	*97*		*73 - 120*		*11/19/21 03:05*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159818-1

Client Sample ID: MW-179S_110921
Date Collected: 11/09/21 10:05
Date Received: 11/11/21 08:00

Lab Sample ID: 240-159818-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 20:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*		*11/12/21 20:11*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 03:27	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 03:27	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 03:27	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 03:27	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 03:27	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 03:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*62 - 137*		*11/19/21 03:27*	*1*
4-Bromofluorobenzene (Surr)	*80*		*56 - 136*		*11/19/21 03:27*	*1*
Toluene-d8 (Surr)	*100*		*78 - 122*		*11/19/21 03:27*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/19/21 03:27*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159818-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159818-1	TRIP BLANK_61	110	76	103	97
240-159818-2	MW-179S_110921	110	80	100	96
240-159830-D-2 MS	Matrix Spike	110	86	101	96
240-159830-E-2 MSD	Matrix Spike Duplicate	107	84	97	94
LCS 240-513667/4	Lab Control Sample	101	85	107	94
MB 240-513667/6	Method Blank	110	81	108	98

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159541-G-2 MS	Matrix Spike	77
240-159541-M-2 MSD	Matrix Spike Duplicate	78
240-159818-2	MW-179S_110921	75
LCS 240-512785/4	Lab Control Sample	79
MB 240-512785/5	Method Blank	79

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513667/6
Matrix: Water
Analysis Batch: 513667

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 23:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 23:24	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 23:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 23:24	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 23:24	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 23:24	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*62 - 137*		*11/18/21 23:24*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/18/21 23:24*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/18/21 23:24*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/18/21 23:24*	*1*

Lab Sample ID: LCS 240-513667/4
Matrix: Water
Analysis Batch: 513667

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.6		ug/L		106	63 - 134
cis-1,2-Dichloroethene	10.0	10.7		ug/L		107	77 - 123
Tetrachloroethene	10.0	12.0		ug/L		120	76 - 123
trans-1,2-Dichloroethene	10.0	10.6		ug/L		106	75 - 124
Trichloroethene	10.0	9.72		ug/L		97	70 - 122
Vinyl chloride	10.0	7.48		ug/L		75	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*101*		*62 - 137*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*
Toluene-d8 (Surr)	*107*		*78 - 122*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: 240-159830-D-2 MS
Matrix: Water
Analysis Batch: 513667

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	8.06		ug/L		81	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.32		ug/L		93	66 - 128
Tetrachloroethene	1.0	U	10.0	9.01		ug/L		90	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.50		ug/L		95	56 - 136
Trichloroethene	1.0	U	10.0	8.17		ug/L		82	61 - 124
Vinyl chloride	1.0	U	10.0	7.02		ug/L		70	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*110*		*62 - 137*
4-Bromofluorobenzene (Surr)	*86*		*56 - 136*
Toluene-d8 (Surr)	*101*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159830-D-2 MS
Matrix: Water
Analysis Batch: 513667

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	96		73 - 120

Lab Sample ID: 240-159830-E-2 MSD
Matrix: Water
Analysis Batch: 513667

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	7.67		ug/L		77	56 - 135	5	26
cis-1,2-Dichloroethene	1.0	U	10.0	8.48		ug/L		85	66 - 128	9	14
Tetrachloroethene	1.0	U	10.0	8.29		ug/L		83	62 - 131	8	20
trans-1,2-Dichloroethene	1.0	U	10.0	8.31		ug/L		83	56 - 136	13	15
Trichloroethene	1.0	U	10.0	7.56		ug/L		76	61 - 124	8	15
Vinyl chloride	1.0	U	10.0	6.48		ug/L		65	43 - 157	8	24

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	107		62 - 137
4-Bromofluorobenzene (Surr)	84		56 - 136
Toluene-d8 (Surr)	97		78 - 122
Dibromofluoromethane (Surr)	94		73 - 120

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512785/5
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 18:32	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	79		66 - 120		11/12/21 18:32	1

Lab Sample ID: LCS 240-512785/4
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.7		ug/L		107	80 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	79		66 - 120

Lab Sample ID: 240-159541-G-2 MS
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

Lab Sample ID: 240-159541-M-2 MSD
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.4		ug/L		104	51 - 153	2	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*

GC/MS VOA

Analysis Batch: 512785

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159818-2	MW-179S_110921	Total/NA	Water	8260B SIM	
MB 240-512785/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512785/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159541-G-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159541-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513667

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159818-1	TRIP BLANK_61	Total/NA	Water	8260B	
240-159818-2	MW-179S_110921	Total/NA	Water	8260B	
MB 240-513667/6	Method Blank	Total/NA	Water	8260B	
LCS 240-513667/4	Lab Control Sample	Total/NA	Water	8260B	
240-159830-D-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159830-E-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159818-1

Client Sample ID: TRIP BLANK_61

Lab Sample ID: 240-159818-1

Date Collected: 11/09/21 00:00

Matrix: Water

Date Received: 11/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513667	11/19/21 03:05	LEE	TAL CAN

Client Sample ID: MW-179S_110921

Lab Sample ID: 240-159818-2

Date Collected: 11/09/21 10:05

Matrix: Water

Date Received: 11/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513667	11/19/21 03:27	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512785	11/12/21 20:11	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159818-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Seth Turner	TAT if different from below		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:	10 day (✓) 3 weeks / 2 weeks / 1 week / 2 days / 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 61	—	—		X						1							X	X	X	X	X	X	X	1 Trip Blank
MW-1795_110921	11/09/21	1005		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159818 Chain of Custody

Possible Hazard Identification: (✓) Non-Hazard ( ) Flammable ( ) Skin Irritant ( ) Poison B ( ) Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ( ) Return to Client (✓) Disposal ByLab ( ) Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E20363
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Seth Turner	Arcadis	11/9/21 1330	Novi Cold Storage	Arcadis	11/9/21 1330
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Arcadis	11/10/21 10:40		GTA	11/10/21 1021
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
	GTA	11/10/21 1047	Tammy Reger	ETA	11-11-21 800

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11/26/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 159818
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Tammy Dorp

Cooler Received on 11-11-21 Opened on 11-11-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 4.5 °C Corrected Cooler Temp. 4.6 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
   -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? Yes No
11. Sufficient quantity received to perform indicated analyses? Yes No
12. Are these work share samples and all listed on the COC? Yes No
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# **HC157842**
14. Were VOAs on the COC? Yes No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 60358 Yes No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

No SIM on TB per Corrected COC, [initials] 11/11/21

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

WI-NC-099

DATA VERIFICATION REPORT

November 26, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159818-1
Sample date: 2021-11-09
Report received by CADENA: 2021-11-26
Initial Data Verification completed by CADENA: 2021-11-26
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159818-1

		Sample Name:	TRIP BLANK_61				MW-179S_110921			
		Lab Sample ID:	2401598181				2401598182			
		Sample Date:	11/9/2021				11/9/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

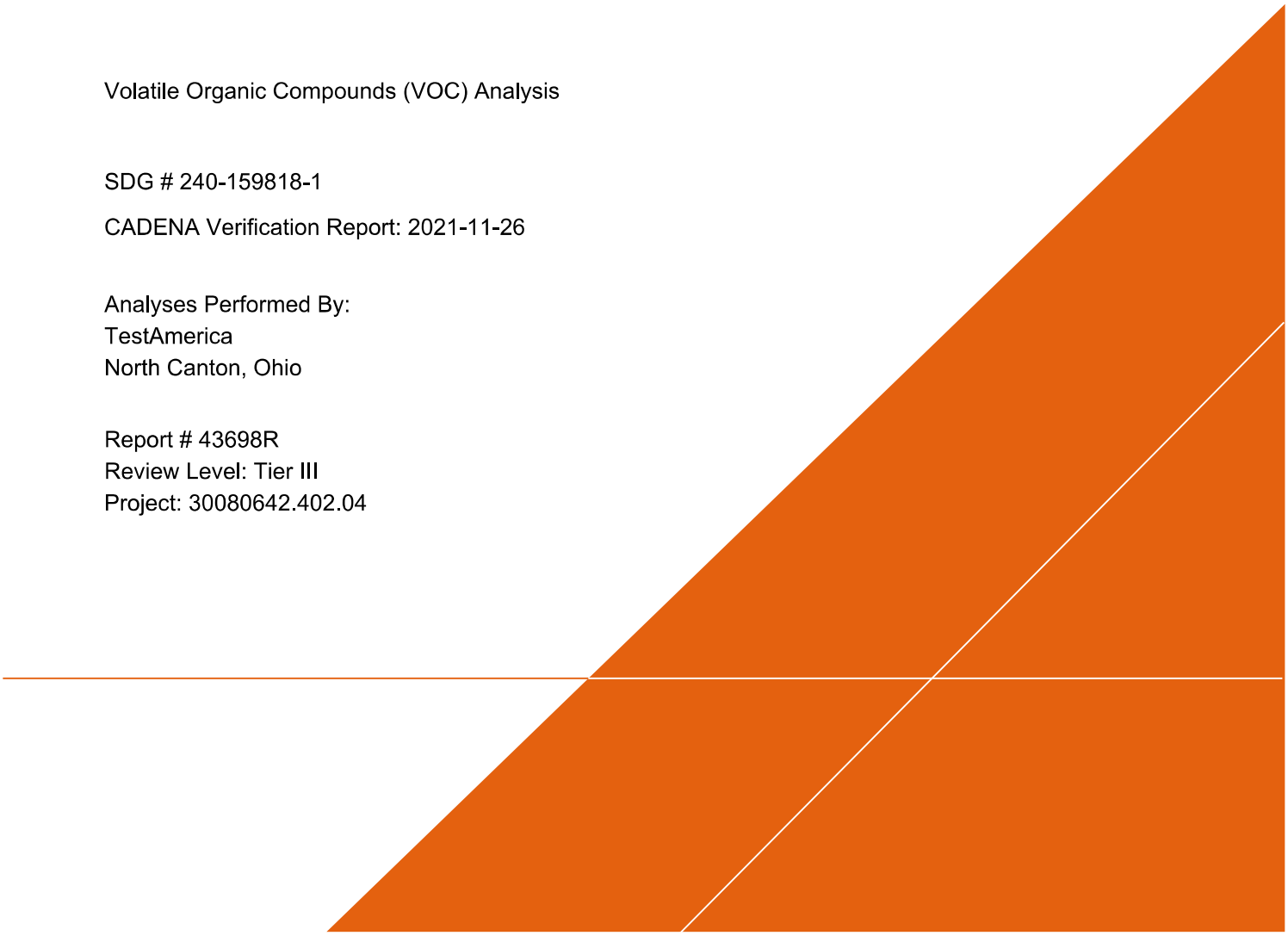
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159818-1

CADENA Verification Report: 2021-11-26

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43698R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159818-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_61	240-159818-1	Water	11/09/21		X	
MW-179S_110921	240-159818-2	Water	11/09/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 13, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Seth Turner	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAcr / NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 61	—	—		X						1							X	X	X	X	X	X	X	1 Trip Blank
MW-1795_111021	11/9/21	1005		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159818 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203831
Level IV Reporting requested.

	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by: Seth Turner	Arcadis	11/9/21 1330	Novi Cold Storage	Arcadis	11/9/21 1330
Relinquished by:	Arcadis	10/10/21 10:40	Received by:	GSA	11/10/21 1021
Relinquished by:	GSA	11/10/21 1047	Received in Laboratory by:	ETA	11-11-21 800

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Client Sample ID: TRIP BLANK_61
Lab Sample ID: 240-159818-1
Date Collected: 11/09/21 00:00
Matrix: Water
Date Received: 11/11/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 03:05	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 03:05	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 03:05	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 03:05	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 03:05	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 03:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*62 - 137*		*11/19/21 03:05*	*1*
4-Bromofluorobenzene (Surr)	*76*		*56 - 136*		*11/19/21 03:05*	*1*
Toluene-d8 (Surr)	*103*		*78 - 122*		*11/19/21 03:05*	*1*
Dibromofluoromethane (Surr)	*97*		*73 - 120*		*11/19/21 03:05*	*1*

Client Sample ID: MW-179S_110921
Lab Sample ID: 240-159818-2
Date Collected: 11/09/21 10:05
Matrix: Water
Date Received: 11/11/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 20:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*		*11/12/21 20:11*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 03:27	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 03:27	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 03:27	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 03:27	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 03:27	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 03:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*62 - 137*		*11/19/21 03:27*	*1*
4-Bromofluorobenzene (Surr)	*80*		*56 - 136*		*11/19/21 03:27*	*1*
Toluene-d8 (Surr)	*100*		*78 - 122*		*11/19/21 03:27*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/19/21 03:27*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159957-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/29/2021 8:34:27 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159957-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159957-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159957-1

Comments
No additional comments.

Receipt
The samples were received on 11/12/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.6° C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) associated with batch 513804 recovered above the upper control limit for Vinyl Chloride. The samples associated with this CCV were non-detect for the affected analyte; therefore, the data have been reported. The associated samples are impacted: TRIP BLANK_67 (240-159957-1) and MW-180SR_111021 (240-159957-2).

Method 8260B: The laboratory control sample (LCS) for 513804 recovered outside control limits for Tetrachloroethene. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159957-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159957-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159957-1	TRIP BLANK_67	Water	11/10/21 00:00	11/12/21 08:00
240-159957-2	MW-180SR_111021	Water	11/10/21 09:10	11/12/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159957-1

Client Sample ID: TRIP BLANK_67 — Lab Sample ID: 240-159957-1

No Detections.

Client Sample ID: MW-180SR_111021 — Lab Sample ID: 240-159957-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159957-1

Client Sample ID: TRIP BLANK_67
Date Collected: 11/10/21 00:00
Date Received: 11/12/21 08:00

Lab Sample ID: 240-159957-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 18:37	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 18:37	1
Tetrachloroethene	1.0	U *+	1.0	0.44	ug/L			11/19/21 18:37	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 18:37	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 18:37	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 18:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*		*11/19/21 18:37*	*1*
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*11/19/21 18:37*	*1*
Toluene-d8 (Surr)	*116*		*78 - 122*		*11/19/21 18:37*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/19/21 18:37*	*1*

Client Sample ID: MW-180SR_111021

Date Collected: 11/10/21 09:10
Date Received: 11/12/21 08:00

Lab Sample ID: 240-159957-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 03:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*66 - 120*		*11/18/21 03:32*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 18:59	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 18:59	1
Tetrachloroethene	1.0	U *+	1.0	0.44	ug/L			11/19/21 18:59	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 18:59	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 18:59	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 18:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*62 - 137*		*11/19/21 18:59*	*1*
4-Bromofluorobenzene (Surr)	*69*		*56 - 136*		*11/19/21 18:59*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/19/21 18:59*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/19/21 18:59*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159957-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159953-A-2 MS	Matrix Spike	100	85	115	96
240-159953-D-2 MSD	Matrix Spike Duplicate	99	87	112	92
240-159957-1	TRIP BLANK_67	100	73	116	98
240-159957-2	MW-180SR_111021	101	69	108	96
LCS 240-513804/4	Lab Control Sample	100	87	118	98
MB 240-513804/6	Method Blank	105	81	118	101

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159642-H-3 MS	Matrix Spike	87
240-159642-M-3 MSD	Matrix Spike Duplicate	87
240-159957-2	MW-180SR_111021	88
LCS 240-513480/3	Lab Control Sample	84
MB 240-513480/4	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513804/6
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 15:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 15:38	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 15:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 15:38	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 15:38	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 15:38	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/19/21 15:38*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/19/21 15:38*	*1*
Toluene-d8 (Surr)	*118*		*78 - 122*		*11/19/21 15:38*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/19/21 15:38*	*1*

Lab Sample ID: LCS 240-513804/4
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	11.0		ug/L		110	63 - 134
cis-1,2-Dichloroethene	10.0	11.0		ug/L		110	77 - 123
Tetrachloroethene	10.0	13.0	*+	ug/L		130	76 - 123
trans-1,2-Dichloroethene	10.0	10.8		ug/L		108	75 - 124
Trichloroethene	10.0	9.54		ug/L		95	70 - 122
Vinyl chloride	10.0	11.1		ug/L		111	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*118*		*78 - 122*
Dibromofluoromethane (Surr)	*98*		*73 - 120*

Lab Sample ID: 240-159953-A-2 MS
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	10.3		ug/L		103	66 - 128
Tetrachloroethene	1.0	U *+	10.0	10.2		ug/L		102	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	56 - 136
Trichloroethene	1.0	U	10.0	8.59		ug/L		86	61 - 124
Vinyl chloride	1.0	U	10.0	10.2		ug/L		102	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*
Toluene-d8 (Surr)	*115*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159953-A-2 MS
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*96*		*73 - 120*

Lab Sample ID: 240-159953-D-2 MSD
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.86		ug/L		99	56 - 135	5	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.79		ug/L		98	66 - 128	5	14
Tetrachloroethene	1.0	U *+	10.0	9.63		ug/L		96	62 - 131	6	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.82		ug/L		98	56 - 136	5	15
Trichloroethene	1.0	U	10.0	8.28		ug/L		83	61 - 124	4	15
Vinyl chloride	1.0	U	10.0	10.7		ug/L		107	43 - 157	5	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*112*		*78 - 122*
Dibromofluoromethane (Surr)	*92*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513480/4
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 19:58	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/17/21 19:58*	*1*

Lab Sample ID: LCS 240-513480/3
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.37		ug/L		94	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*

Lab Sample ID: 240-159642-H-3 MS
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.3		ug/L		103	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

Lab Sample ID: 240-159642-M-3 MSD
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.57		ug/L		96	51 - 153	7	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159957-1

GC/MS VOA

Analysis Batch: 513480

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159957-2	MW-180SR_111021	Total/NA	Water	8260B SIM	
MB 240-513480/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513480/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159642-H-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159642-M-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513804

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159957-1	TRIP BLANK_67	Total/NA	Water	8260B	
240-159957-2	MW-180SR_111021	Total/NA	Water	8260B	
MB 240-513804/6	Method Blank	Total/NA	Water	8260B	
LCS 240-513804/4	Lab Control Sample	Total/NA	Water	8260B	
240-159953-A-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159953-D-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159957-1

Client Sample ID: TRIP BLANK_67

Lab Sample ID: 240-159957-1

Date Collected: 11/10/21 00:00

Matrix: Water

Date Received: 11/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513804	11/19/21 18:37	LEE	TAL CAN

Client Sample ID: MW-180SR_111021

Lab Sample ID: 240-159957-2

Date Collected: 11/10/21 09:10

Matrix: Water

Date Received: 11/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513804	11/19/21 18:59	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513480	11/18/21 03:32	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159957-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton – 10449 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2769

Regulatory program: DW NPDES RCRA Other

Client Contact	Client Project Manager: Kris Illesley	Site Contact: Julia McCafferty	Lab Contact: Mike DelMonaco	TestAmerica Laboratories, Inc.
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 336-437-8396	COC No:
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.illesley@arcadis.com	Analysis Turnaround Time		1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Sampler:	TAT if different from below:		For lab use only
Phone: 248-994-2240	Method of Shipment/Carrier:	10 day — 3 weeks / 2 weeks / 1 week / 2 days / 1 day		Walk-in client:
Project Name: Ford LTP Offsite	Shipping/Tracking No:			Lab sampling:
Project Number: 30068643.402.04				Job/SDG No.:
PO # 30068643.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: HNO3	H2SO4	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite (C) / Grab (G)	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_12	—	—		X						4						G	X	X	X	X	X	X	X	1 Trip Blank
MW-23_11521	11/10/21	1107		X						6						G				X	X	X	X	2 VOAs for 8260B 3 VOAs for 8260B SIM

240-159957 Chain of Custody

Possible Hazard Identification: Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / Disposal By Lab / Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cascade at jbwellsite@arcadis.com. Contact if Critical Level IV Reporting required.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
		11/10/21 1050			11/10/21 1050
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	ARCADIS	11/10/21 1350		ETA	11/10/21 0700
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
	ETA	11-11-21 1046		ETA	11/11/21 1046

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11/29/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159957**
Canton Facility

Client Arcadis Site Name

Cooler Received on 11/12/21 Opened on 11/12/21

Cooler unpacked by: Matthew Surma

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.5 °C Corrected Cooler Temp. 0.6 °C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2 Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	~~No~~ N.A.
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No	(NA) pH Strip Lot# **HC157842**
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ____	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes	(No)

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

No SIM on TB per Corrected COC. Date 11/12/21

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.

Sample(s) ____ were received in a broken container.

Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.

Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

November 29, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159957-1
Sample date: 2021-11-10
Report received by CADENA: 2021-11-29
Initial Data Verification completed by CADENA: 2021-11-29
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 513804 LCS recovery was outlying biased high for the following analyte: TETRACHLOROETHENE. Associated client sample results were non-detect so qualification was not required based on this high bias QC outlier.

GCMS VOC QC batch CCV response outliers as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159957-1

		Sample Name:	TRIP BLANK_67				MW-180SR_111021			
		Lab Sample ID:	2401599571				2401599572			
		Sample Date:	11/10/2021				11/10/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

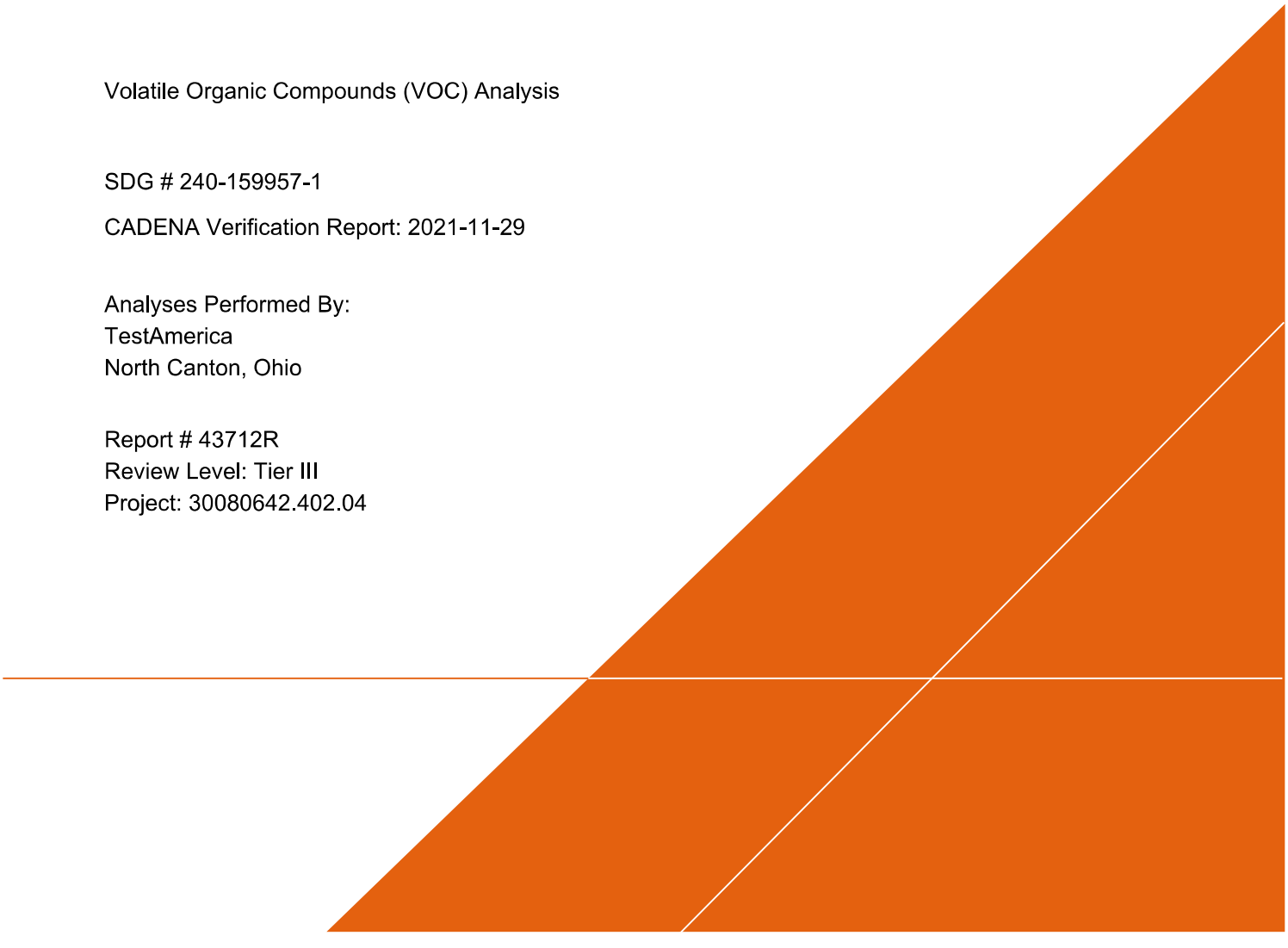
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159957-1

CADENA Verification Report: 2021-11-29

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43712R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159957-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_67	240-159957-1	Water	11/10/21		X	
MW-180SR_111021	240-159957-2	Water	11/10/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Compound	Criteria
TRIP BLANK_67 MW-180SR_111021	Continuous Calibration Verification %D	Vinyl chloride	+30.0%
		cis-1,2-Dichloroethene	+20.5%
		Tetrachloroethene	+21.1%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J

Initial/Continuing	Criteria	Sample Result	Qualification
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Sean Turner		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30080642.402.04	Shipping/Tracking No:		
PO # 30080642.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below: 10 day ✓ 3 weeks, 2 weeks, 1 week, 2 days, 1 day

Analyses

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_67	—	—		X						1					N	G	X	X	X	X	X	X	~~X~~	1 Trip Blank
MW-180SR_111021	11/10/21	910		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159957 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client ✓ Disposal By Lab Archive For Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco com. Cadena #E203631
Level IV Reporting requested

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Sean Turner	Arcadis	11/10/21 / 1330	Novi Cold Storage	Arcadis	11/10/21 / 1330
Charlotte [illegible]	ARCADIS	11/11/21 0950	Jeri Hal	ETA	11/11/21 0950
Jeri Hal	ETA	11-11-21 1046	Received in Laboratory by: M.S.S.	Company: ETA	Date/Time: 11/12/21 8:00

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11/22/2021

Client Sample ID: TRIP BLANK_67
Lab Sample ID: 240-159957-1

Date Collected: 11/10/21 00:00
Matrix: Water
Date Received: 11/12/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 18:37	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 18:37	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 18:37	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 18:37	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 18:37	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 18:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*		*11/19/21 18:37*	*1*
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*11/19/21 18:37*	*1*
Toluene-d8 (Surr)	*116*		*78 - 122*		*11/19/21 18:37*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/19/21 18:37*	*1*

Client Sample ID: MW-180SR_111021
Lab Sample ID: 240-159957-2

Date Collected: 11/10/21 09:10
Matrix: Water
Date Received: 11/12/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 03:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*66 - 120*		*11/18/21 03:32*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 18:59	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 18:59	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 18:59	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 18:59	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 18:59	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 18:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*62 - 137*		*11/19/21 18:59*	*1*
4-Bromofluorobenzene (Surr)	*69*		*56 - 136*		*11/19/21 18:59*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/19/21 18:59*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/19/21 18:59*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159716-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/24/2021 8:27:38 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159716-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159716-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159716-1

Comments
No additional comments.

Receipt
The samples were received on 11/10/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 0.7° C and 0.8° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159716-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159716-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159716-1	TRIP BLANK_96	Water	11/08/21 00:00	11/10/21 08:00
240-159716-2	MW-104S_110821	Water	11/08/21 14:01	11/10/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159716-1

Client Sample ID: TRIP BLANK_96 — Lab Sample ID: 240-159716-1

No Detections.

Client Sample ID: MW-104S_110821 — Lab Sample ID: 240-159716-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159716-1

Client Sample ID: TRIP BLANK_96
Date Collected: 11/08/21 00:00
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159716-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 17:34	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 17:34	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 17:34	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 17:34	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 17:34	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 17:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*113*		*62 - 137*		*11/17/21 17:34*	*1*
4-Bromofluorobenzene (Surr)	*65*		*56 - 136*		*11/17/21 17:34*	*1*
Toluene-d8 (Surr)	*85*		*78 - 122*		*11/17/21 17:34*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/17/21 17:34*	*1*

Client Sample ID: MW-104S_110821
Date Collected: 11/08/21 14:01
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159716-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 02:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*76*		*66 - 120*		*11/18/21 02:47*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 17:55	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 17:55	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 17:55	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 17:55	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 17:55	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 17:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*62 - 137*		*11/17/21 17:55*	*1*
4-Bromofluorobenzene (Surr)	*69*		*56 - 136*		*11/17/21 17:55*	*1*
Toluene-d8 (Surr)	*86*		*78 - 122*		*11/17/21 17:55*	*1*
Dibromofluoromethane (Surr)	*97*		*73 - 120*		*11/17/21 17:55*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159716-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159716-1	TRIP BLANK_96	113	65	85	96
240-159716-2	MW-104S_110821	117	69	86	97
240-159724-A-2 MS	Matrix Spike	96	99	103	84
240-159724-C-2 MSD	Matrix Spike Duplicate	97	97	106	86
LCS 240-513417/4	Lab Control Sample	93	97	98	84
MB 240-513417/7	Method Blank	105	76	89	91

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159636-H-2 MS	Matrix Spike	77
240-159636-N-2 MSD	Matrix Spike Duplicate	77
240-159716-2	MW-104S_110821	76
LCS 240-513479/4	Lab Control Sample	78
MB 240-513479/5	Method Blank	77

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513417/7
Matrix: Water
Analysis Batch: 513417

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 13:33	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 13:33	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 13:33	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 13:33	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 13:33	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 13:33	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/17/21 13:33*	*1*
4-Bromofluorobenzene (Surr)	*76*		*56 - 136*		*11/17/21 13:33*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/17/21 13:33*	*1*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*11/17/21 13:33*	*1*

Lab Sample ID: LCS 240-513417/4
Matrix: Water
Analysis Batch: 513417

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.24		ug/L		92	63 - 134
cis-1,2-Dichloroethene	10.0	9.72		ug/L		97	77 - 123
Tetrachloroethene	10.0	9.53		ug/L		95	76 - 123
trans-1,2-Dichloroethene	10.0	10.1		ug/L		101	75 - 124
Trichloroethene	10.0	8.80		ug/L		88	70 - 122
Vinyl chloride	10.0	11.6		ug/L		116	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*97*		*56 - 136*
Toluene-d8 (Surr)	*98*		*78 - 122*
Dibromofluoromethane (Surr)	*84*		*73 - 120*

Lab Sample ID: 240-159724-A-2 MS
Matrix: Water
Analysis Batch: 513417

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	8.39		ug/L		84	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	8.85		ug/L		88	66 - 128
Tetrachloroethene	1.0	U	10.0	8.96		ug/L		90	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.58		ug/L		96	56 - 136
Trichloroethene	1.0	U	10.0	7.89		ug/L		79	61 - 124
Vinyl chloride	2.8		10.0	14.2		ug/L		114	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*
4-Bromofluorobenzene (Surr)	*99*		*56 - 136*
Toluene-d8 (Surr)	*103*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159724-A-2 MS
Matrix: Water
Analysis Batch: 513417

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*84*		*73 - 120*

Lab Sample ID: 240-159724-C-2 MSD
Matrix: Water
Analysis Batch: 513417

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	7.80		ug/L		78	56 - 135	7	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.45		ug/L		95	66 - 128	7	14
Tetrachloroethene	1.0	U	10.0	9.27		ug/L		93	62 - 131	3	20
trans-1,2-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	56 - 136	8	15
Trichloroethene	1.0	U	10.0	8.32		ug/L		83	61 - 124	5	15
Vinyl chloride	2.8		10.0	15.8		ug/L		130	43 - 157	11	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*62 - 137*
4-Bromofluorobenzene (Surr)	*97*		*56 - 136*
Toluene-d8 (Surr)	*106*		*78 - 122*
Dibromofluoromethane (Surr)	*86*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513479/5
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 17:41	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*		*11/17/21 17:41*	*1*

Lab Sample ID: LCS 240-513479/4
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	11.9		ug/L		119	80 - 122		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*

Lab Sample ID: 240-159636-H-2 MS
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153		

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

Lab Sample ID: 240-159636-N-2 MSD
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153	0	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159716-1

GC/MS VOA

Analysis Batch: 513417

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159716-1	TRIP BLANK_96	Total/NA	Water	8260B	
240-159716-2	MW-104S_110821	Total/NA	Water	8260B	
MB 240-513417/7	Method Blank	Total/NA	Water	8260B	
LCS 240-513417/4	Lab Control Sample	Total/NA	Water	8260B	
240-159724-A-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159724-C-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 513479

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159716-2	MW-104S_110821	Total/NA	Water	8260B SIM	
MB 240-513479/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513479/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159636-H-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159636-N-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159716-1

Client Sample ID: TRIP BLANK_96

Lab Sample ID: 240-159716-1

Date Collected: 11/08/21 00:00

Matrix: Water

Date Received: 11/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513417	11/17/21 17:34	LEE	TAL CAN

Client Sample ID: MW-104S_110821

Lab Sample ID: 240-159716-2

Date Collected: 11/08/21 14:01

Matrix: Water

Date Received: 11/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513417	11/17/21 17:55	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513479	11/18/21 02:47	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159716-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM			Sample Specific Notes / Special Instructions:
TRIP BLANK_96	---	---		X						1					N	G	X	X	X	X	X	X	*			1 Trip Blank
MW-104S-110821	11/08/21	1401		X						6					N	G	X	X	X	X	X	X	X			3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159716 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time	Received by	Company	Date/Time
Relinquished by: Gary Schafer	Arcadis	11/08/21 1632	Novi Cold Storage	Arcadis	11/08/21 1632
Relinquished by:	ARCADIS	11/9/21 1040		ETA	11/9/21 1040
Relinquished by: Jeri Hare	ETA	11/9/21 1055	Received in Laboratory by: Mandolyn Black	ETA	11-10-21 8:00

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11/24/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 59710

Client Arcadis Site Name

Cooler Received on 11-10-21 Opened on 11-10-21

Cooler unpacked by: Mandolyn Beaver

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: ~~Bubble Wrap~~ Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt — See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity_____	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC157842
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #_____	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

No SIM on TB per Corrected COC. ONE 11-10-21

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

Login # : 159716

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form				
Cooler Description (Circle)	**IR Gun # (Circle)**	**Observed Temp °C**	**Corrected Temp °C**	**Coolant (Circle)**
(UPS) Client Box Other	(IR-14) IR-15	0.6	0.7	(Wet Ice) Blue Ice Dry Ice Water None
(TA) Client Box Other	(IR-14) IR-15	0.7	0.8	(Wet Ice) Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice

DATA VERIFICATION REPORT

November 25, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159716-1
Sample date: 2021-11-08
Report received by CADENA: 2021-11-24
Initial Data Verification completed by CADENA: 2021-11-25
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159716-1

		Sample Name:	TRIP BLANK_96				MW-104S_110821			
		Lab Sample ID:	2401597161				2401597162			
		Sample Date:	11/8/2021				11/8/2021			
	Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC										
	OSW-8260B									
	1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	OSW-8260BBSim									
	1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

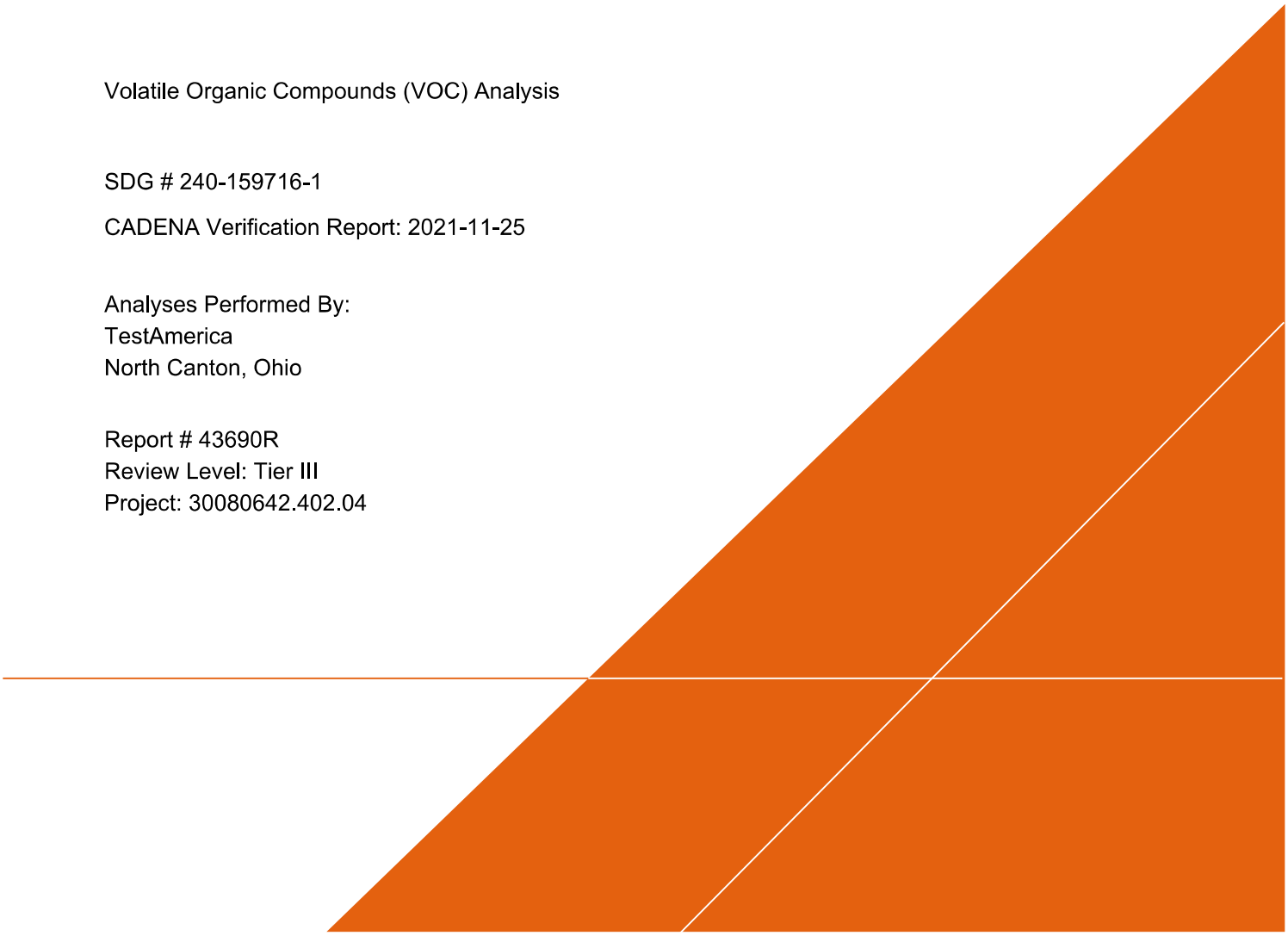
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159716-1

CADENA Verification Report: 2021-11-25

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43690R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159716-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_96	240-159716-1	Water	11/08/21		X	
MW-104S_110821	240-159716-2	Water	11/08/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 10, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 14, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: 10 day; ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_96	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1045_110821	11/08/21	1401		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159716 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time	
Relinquished by: Gary Schafer	Arcadis	11/08/21	1632	Received by: Novi cold storage	Arcadis	11/08/21 1632
Relinquished by:	ARCADIS	11/9/21	1040	Received by:	ETA	11/9/21 1040
Relinquished by: Jeri Hare	ETA	11/9/21	1055	Received in Laboratory by: Mandolyn Block	ETA	11-10-21 8:00

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11/24/2021

Client Sample ID: TRIP BLANK_96
Lab Sample ID: 240-159716-1

Date Collected: 11/08/21 00:00
Matrix: Water
Date Received: 11/10/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 17:34	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 17:34	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 17:34	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 17:34	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 17:34	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 17:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*113*		*62 - 137*		*11/17/21 17:34*	*1*
4-Bromofluorobenzene (Surr)	*65*		*56 - 136*		*11/17/21 17:34*	*1*
Toluene-d8 (Surr)	*85*		*78 - 122*		*11/17/21 17:34*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/17/21 17:34*	*1*

Client Sample ID: MW-104S_110821
Lab Sample ID: 240-159716-2

Date Collected: 11/08/21 14:01
Matrix: Water
Date Received: 11/10/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 02:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*76*		*66 - 120*		*11/18/21 02:47*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 17:55	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 17:55	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 17:55	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 17:55	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 17:55	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 17:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*62 - 137*		*11/17/21 17:55*	*1*
4-Bromofluorobenzene (Surr)	*69*		*56 - 136*		*11/17/21 17:55*	*1*
Toluene-d8 (Surr)	*86*		*78 - 122*		*11/17/21 17:55*	*1*
Dibromofluoromethane (Surr)	*97*		*73 - 120*		*11/17/21 17:55*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159411-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/19/2021 1:46:01 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
Review your project results through TotalAccess
Have a Question? Ask The Expert
Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159411-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159411-1

Job ID: 240-159411-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159411-1

Comments
No additional comments.

Receipt
The samples were received on 11/5/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.7º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159411-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159411-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159411-1	TRIP BLANK_06	Water	11/03/21 00:00	11/05/21 08:00
240-159411-2	MW-159S_110321	Water	11/03/21 13:20	11/05/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159411-1

Client Sample ID: TRIP BLANK_06 — Lab Sample ID: 240-159411-1

No Detections.

Client Sample ID: MW-159S_110321 — Lab Sample ID: 240-159411-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159411-1

Client Sample ID: TRIP BLANK_06
Date Collected: 11/03/21 00:00
Date Received: 11/05/21 08:00

Lab Sample ID: 240-159411-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 15:02	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 15:02	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 15:02	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 15:02	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 15:02	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 15:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*11/13/21 15:02*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/13/21 15:02*	*1*
Toluene-d8 (Surr)	*104*		*78 - 122*		*11/13/21 15:02*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/13/21 15:02*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159411-1

Client Sample ID: MW-159S_110321
Date Collected: 11/03/21 13:20
Date Received: 11/05/21 08:00

Lab Sample ID: 240-159411-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/11/21 06:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*66 - 120*		*11/11/21 06:14*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 15:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 15:24	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 15:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 15:24	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 15:24	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 15:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*62 - 137*		*11/13/21 15:24*	*1*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*		*11/13/21 15:24*	*1*
Toluene-d8 (Surr)	*110*		*78 - 122*		*11/13/21 15:24*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*11/13/21 15:24*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159411-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159411-1	TRIP BLANK_06	96	81	104	94
240-159411-2	MW-159S_110321	95	78	110	95
240-159418-E-2 MS	Matrix Spike	93	87	106	94
240-159418-L-2 MSD	Matrix Spike Duplicate	90	87	107	91
LCS 240-512817/4	Lab Control Sample	90	89	112	90
MB 240-512817/6	Method Blank	98	81	112	98

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159310-G-2 MS	Matrix Spike	84
240-159310-M-2 MSD	Matrix Spike Duplicate	84
240-159411-2	MW-159S_110321	86
LCS 240-512369/6	Lab Control Sample	85
MB 240-512369/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512817/6
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 13:55	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 13:55	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:55	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 13:55	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:55	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 13:55	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*		*11/13/21 13:55*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/13/21 13:55*	*1*
Toluene-d8 (Surr)	*112*		*78 - 122*		*11/13/21 13:55*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/13/21 13:55*	*1*

Lab Sample ID: LCS 240-512817/4
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.9		ug/L		109	63 - 134
cis-1,2-Dichloroethene	10.0	10.3		ug/L		103	77 - 123
Tetrachloroethene	10.0	11.9		ug/L		119	76 - 123
trans-1,2-Dichloroethene	10.0	10.8		ug/L		108	75 - 124
Trichloroethene	10.0	9.19		ug/L		92	70 - 122
Vinyl chloride	10.0	9.48		ug/L		95	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*89*		*56 - 136*
Toluene-d8 (Surr)	*112*		*78 - 122*
Dibromofluoromethane (Surr)	*90*		*73 - 120*

Lab Sample ID: 240-159418-E-2 MS
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	10.3		ug/L		103	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.89		ug/L		99	66 - 128
Tetrachloroethene	1.0	U	10.0	9.53		ug/L		95	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.91		ug/L		99	56 - 136
Trichloroethene	1.0	U	10.0	8.16		ug/L		82	61 - 124
Vinyl chloride	1.0	U	10.0	9.96		ug/L		100	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*106*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159418-E-2 MS
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: 240-159418-L-2 MSD
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	10.0		ug/L		100	56 - 135	2	26
cis-1,2-Dichloroethene	1.0	U	10.0	10.1		ug/L		101	66 - 128	2	14
Tetrachloroethene	1.0	U	10.0	10.1		ug/L		101	62 - 131	5	20
trans-1,2-Dichloroethene	1.0	U	10.0	10.1		ug/L		101	56 - 136	2	15
Trichloroethene	1.0	U	10.0	8.61		ug/L		86	61 - 124	5	15
Vinyl chloride	1.0	U	10.0	10.2		ug/L		102	43 - 157	3	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*107*		*78 - 122*
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512369/5
Matrix: Water
Analysis Batch: 512369

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/10/21 19:46	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/10/21 19:46*	*1*

Lab Sample ID: LCS 240-512369/6
Matrix: Water
Analysis Batch: 512369

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.53		ug/L		95	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

Lab Sample ID: 240-159310-G-2 MS
Matrix: Water
Analysis Batch: 512369

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	9.69		ug/L		97	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*

Lab Sample ID: 240-159310-M-2 MSD
Matrix: Water
Analysis Batch: 512369

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.59		ug/L		96	51 - 153	1	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159411-1

GC/MS VOA

Analysis Batch: 512369

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159411-2	MW-159S_110321	Total/NA	Water	8260B SIM	
MB 240-512369/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512369/6	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159310-G-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159310-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 512817

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159411-1	TRIP BLANK_06	Total/NA	Water	8260B	
240-159411-2	MW-159S_110321	Total/NA	Water	8260B	
MB 240-512817/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512817/4	Lab Control Sample	Total/NA	Water	8260B	
240-159418-E-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159418-L-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159411-1

Client Sample ID: TRIP BLANK_06

Lab Sample ID: 240-159411-1

Date Collected: 11/03/21 00:00

Matrix: Water

Date Received: 11/05/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512817	11/13/21 15:02	LEE	TAL CAN

Client Sample ID: MW-159S_110321

Lab Sample ID: 240-159411-2

Date Collected: 11/03/21 13:20

Matrix: Water

Date Received: 11/05/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512817	11/13/21 15:24	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512369	11/11/21 06:14	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159411-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Sommer Guy	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn/Ac/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_06	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1595-110321	11/3/21	13:20		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159411 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Sommer Guy	Arcadis	11/3/21 16:00	Novi Cold Storage	Arcadis	11/3/21 16:00
Christa Allen	ARCADIS	11/4/21 1040	Jen Hale	ETA	11/4/21 1041
Jen Hale	ETA	11/4/21 1049	Received in Laboratory by: M. D. J.	Company: ETA	Date/Time: 11/5/21 8:00

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11/19/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 159411

Client ARCADIS Site Name

Cooler Received on 11/5/21 Opened on 11/5/21

Cooler unpacked by: Mathew Suma

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: ~~Wet Ice~~ Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.6 °C Corrected Cooler Temp. 0.7 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses? (mw 11-5-21)	~~Yes~~	(No)
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# HC157842
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 0104201G	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present?	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

TB is not logged for SIM due to insufficient volume.
(mw) 11-5-21

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.

Sample(s) were received in a broken container.

Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.

Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

DATA VERIFICATION REPORT

November 19, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159411-1
Sample date: 2021-11-03
Report received by CADENA: 2021-11-19
Initial Data Verification completed by CADENA: 2021-11-19
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159411-1

		Sample Name:	TRIP BLANK_06				MW-159S_110321			
		Lab Sample ID:	2401594111				2401594112			
		Sample Date:	11/3/2021				11/3/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

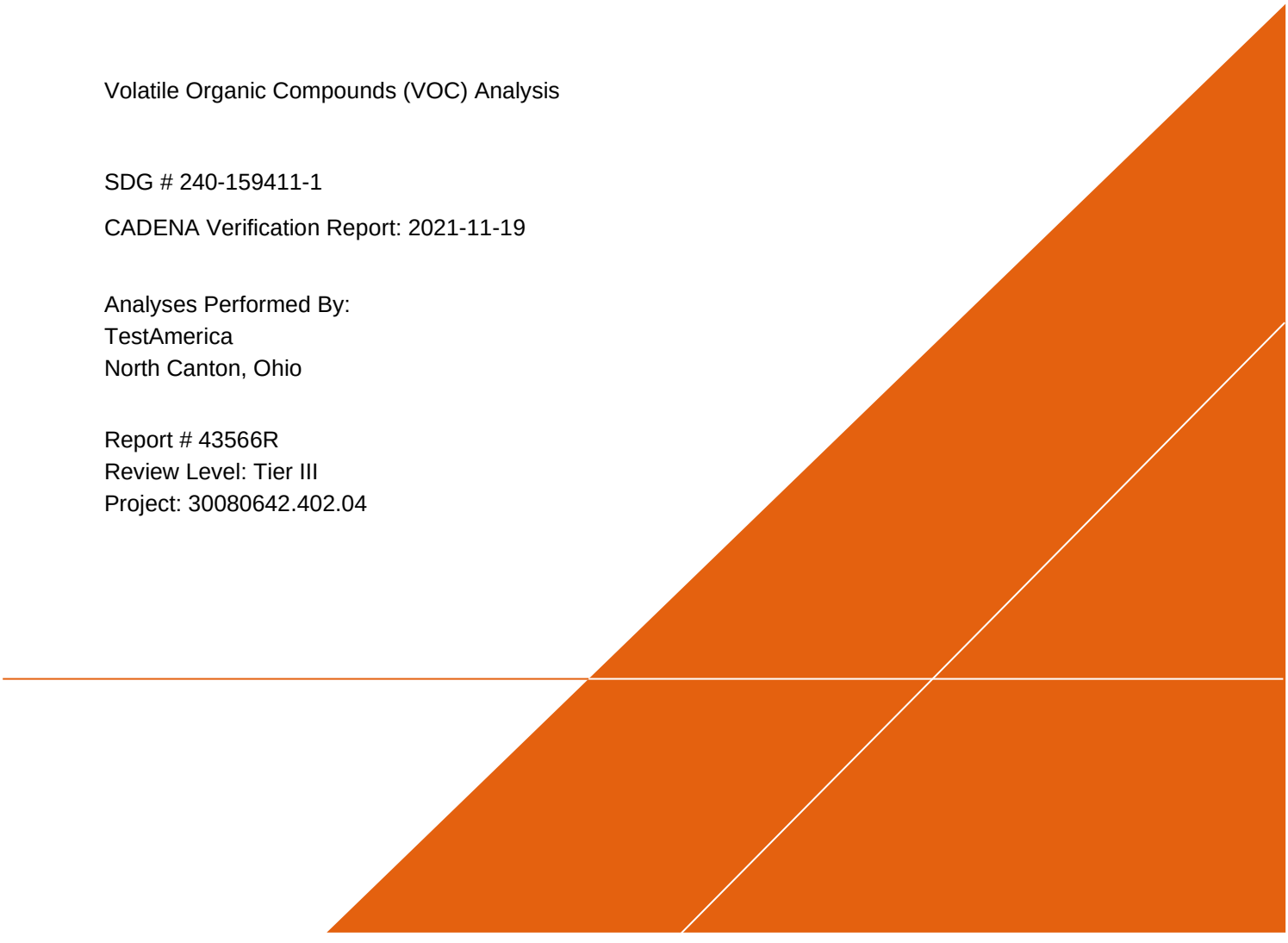
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159411-1

CADENA Verification Report: 2021-11-19

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43566R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159411-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_06	240-159411-1	Water	11/03/21		X	
MW-159S_110321	240-159411-2	Water	11/03/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE:

DATE: December 07, 2021

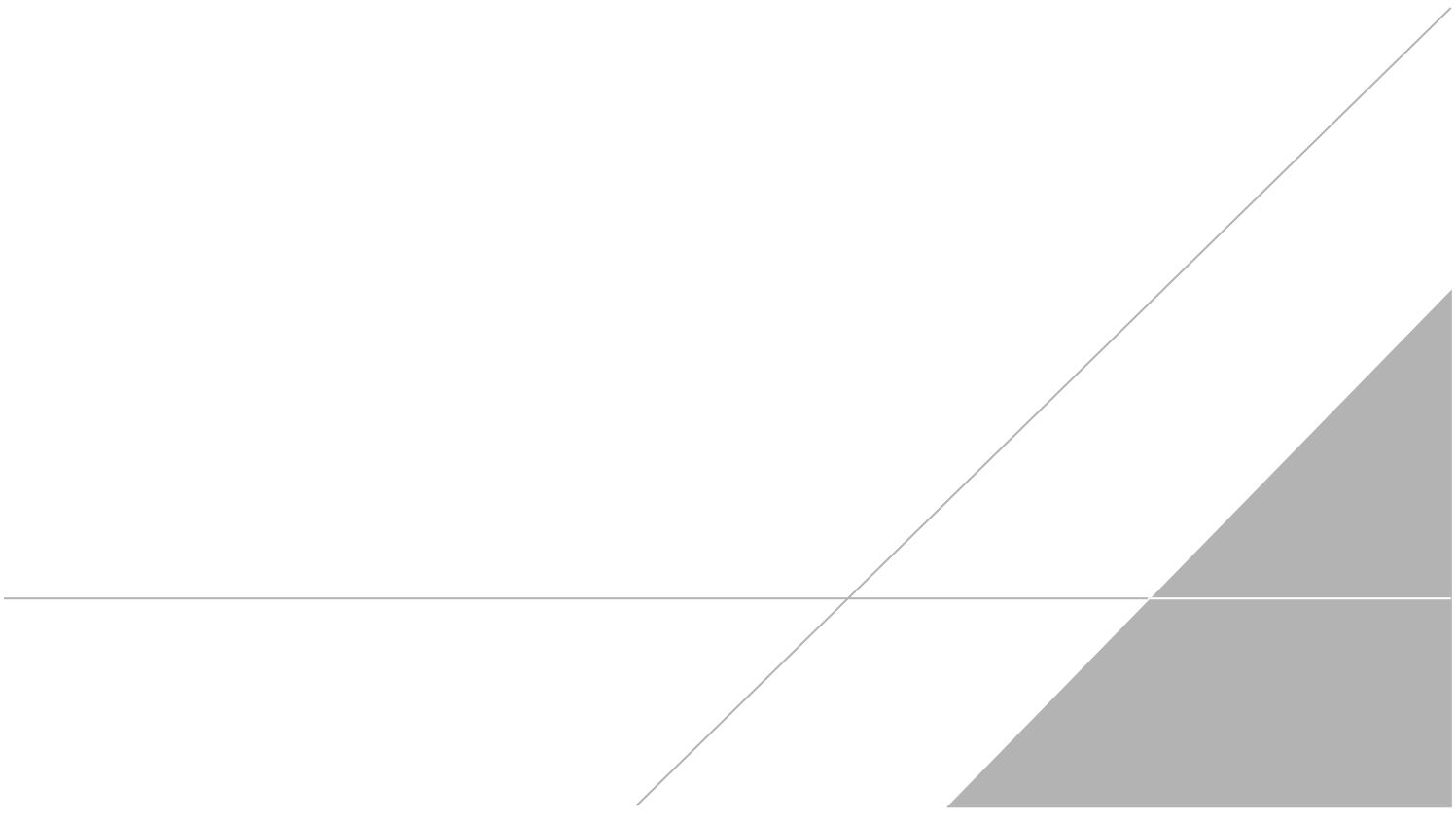
PEER REVIEW: Andrew Korycinski

DATE: December 7, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Sommer Guy	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_06	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1595-110321	11/3/21	13:20		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159411 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	11/3/21 16:00	Novi Cold Storage	Arcadis	11/3/21 16:00
[signature]	ARCADIS	11/4/21 1040	[signature]	ETA	11/4/21 1041
[signature]	ETA	11/4/21 1049	Received in Laboratory by: [signature]	Company: ETA	Date/Time: 11/5/21 8:00

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11/19/2021

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159411-1

Client Sample ID: TRIP BLANK_06
Date Collected: 11/03/21 00:00
Date Received: 11/05/21 08:00

Lab Sample ID: 240-159411-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 15:02	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 15:02	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 15:02	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 15:02	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 15:02	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 15:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*11/13/21 15:02*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/13/21 15:02*	*1*
Toluene-d8 (Surr)	*104*		*78 - 122*		*11/13/21 15:02*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/13/21 15:02*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159411-1

Client Sample ID: MW-159S_110321
Date Collected: 11/03/21 13:20
Date Received: 11/05/21 08:00

Lab Sample ID: 240-159411-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/11/21 06:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*66 - 120*		*11/11/21 06:14*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 15:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 15:24	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 15:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 15:24	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 15:24	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 15:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*62 - 137*		*11/13/21 15:24*	*1*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*		*11/13/21 15:24*	*1*
Toluene-d8 (Surr)	*110*		*78 - 122*		*11/13/21 15:24*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*11/13/21 15:24*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159412-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/19/2021 1:46:44 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159412-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159412-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159412-1

Comments
No additional comments.

Receipt
The samples were received on 11/5/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.7° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159412-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159412-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159412-1	TRIP BLANK_05	Water	11/03/21 00:00	11/05/21 08:00
240-159412-2	MW-185S_110321	Water	11/03/21 11:20	11/05/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159412-1

Client Sample ID: TRIP BLANK_05 — Lab Sample ID: 240-159412-1

No Detections.

Client Sample ID: MW-185S_110321 — Lab Sample ID: 240-159412-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159412-1

Client Sample ID: TRIP BLANK_05
Date Collected: 11/03/21 00:00
Date Received: 11/05/21 08:00

Lab Sample ID: 240-159412-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 15:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 15:46	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 15:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 15:46	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 15:46	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 15:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/13/21 15:46*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/13/21 15:46*	*1*
Toluene-d8 (Surr)	*116*		*78 - 122*		*11/13/21 15:46*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/13/21 15:46*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159412-1

Client Sample ID: MW-185S_110321

Lab Sample ID: 240-159412-2

Date Collected: 11/03/21 11:20

Matrix: Water

Date Received: 11/05/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/11/21 21:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/11/21 21:03*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 16:09	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 16:09	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 16:09	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 16:09	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 16:09	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 16:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*		*11/13/21 16:09*	*1*
4-Bromofluorobenzene (Surr)	*86*		*56 - 136*		*11/13/21 16:09*	*1*
Toluene-d8 (Surr)	*113*		*78 - 122*		*11/13/21 16:09*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/13/21 16:09*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159412-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159412-1	TRIP BLANK_05	99	82	116	98
240-159412-2	MW-185S_110321	102	86	113	99
240-159418-E-2 MS	Matrix Spike	93	87	106	94
240-159418-L-2 MSD	Matrix Spike Duplicate	90	87	107	91
LCS 240-512817/4	Lab Control Sample	90	89	112	90
MB 240-512817/6	Method Blank	98	81	112	98

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159412-2	MW-185S_110321	85
240-159418-H-2 MS	Matrix Spike	82
240-159418-P-2 MSD	Matrix Spike Duplicate	83
LCS 240-512585/4	Lab Control Sample	81
MB 240-512585/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512817/6
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 13:55	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 13:55	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:55	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 13:55	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:55	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 13:55	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*		*11/13/21 13:55*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/13/21 13:55*	*1*
Toluene-d8 (Surr)	*112*		*78 - 122*		*11/13/21 13:55*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/13/21 13:55*	*1*

Lab Sample ID: LCS 240-512817/4
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.9		ug/L		109	63 - 134
cis-1,2-Dichloroethene	10.0	10.3		ug/L		103	77 - 123
Tetrachloroethene	10.0	11.9		ug/L		119	76 - 123
trans-1,2-Dichloroethene	10.0	10.8		ug/L		108	75 - 124
Trichloroethene	10.0	9.19		ug/L		92	70 - 122
Vinyl chloride	10.0	9.48		ug/L		95	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*89*		*56 - 136*
Toluene-d8 (Surr)	*112*		*78 - 122*
Dibromofluoromethane (Surr)	*90*		*73 - 120*

Lab Sample ID: 240-159418-E-2 MS
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	10.3		ug/L		103	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.89		ug/L		99	66 - 128
Tetrachloroethene	1.0	U	10.0	9.53		ug/L		95	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.91		ug/L		99	56 - 136
Trichloroethene	1.0	U	10.0	8.16		ug/L		82	61 - 124
Vinyl chloride	1.0	U	10.0	9.96		ug/L		100	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*106*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159418-E-2 MS
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: 240-159418-L-2 MSD
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	10.0		ug/L		100	56 - 135	2	26
cis-1,2-Dichloroethene	1.0	U	10.0	10.1		ug/L		101	66 - 128	2	14
Tetrachloroethene	1.0	U	10.0	10.1		ug/L		101	62 - 131	5	20
trans-1,2-Dichloroethene	1.0	U	10.0	10.1		ug/L		101	56 - 136	2	15
Trichloroethene	1.0	U	10.0	8.61		ug/L		86	61 - 124	5	15
Vinyl chloride	1.0	U	10.0	10.2		ug/L		102	43 - 157	3	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*107*		*78 - 122*
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512585/5
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/11/21 19:04	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/11/21 19:04*	*1*

Lab Sample ID: LCS 240-512585/4
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.86		ug/L		99	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*

Lab Sample ID: 240-159418-H-2 MS
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	11.1		ug/L		111	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159418-P-2 MSD
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.2		ug/L		102	51 - 153	8	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159412-1

GC/MS VOA

Analysis Batch: 512585

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159412-2	MW-185S_110321	Total/NA	Water	8260B SIM	
MB 240-512585/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512585/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159418-H-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159418-P-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 512817

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159412-1	TRIP BLANK_05	Total/NA	Water	8260B	
240-159412-2	MW-185S_110321	Total/NA	Water	8260B	
MB 240-512817/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512817/4	Lab Control Sample	Total/NA	Water	8260B	
240-159418-E-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159418-L-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159412-1

Client Sample ID: TRIP BLANK_05

Lab Sample ID: 240-159412-1

Date Collected: 11/03/21 00:00

Matrix: Water

Date Received: 11/05/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512817	11/13/21 15:46	LEE	TAL CAN

Client Sample ID: MW-185S_110321

Lab Sample ID: 240-159412-2

Date Collected: 11/03/21 11:20

Matrix: Water

Date Received: 11/05/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512817	11/13/21 16:09	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512585	11/11/21 21:03	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159412-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

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Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Sommer Guy	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day (10 day)		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_05	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1855_110321	11/3/21	11:20		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159412 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ an Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For [ ] Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: Sommer Guy	Arcadis	11/3/21 16:00	Received by: Novi Cold Storage	Arcadis	11/3/21 16:00
Relinquished by: [signature]	ARCADIS	11/4/21 1040	Received by: Teri Hall	ETA	11/4/21 1041
Relinquished by: Teri Hall	ETA	11/4/21 1049	Received in Laboratory by: M. A. S.	ETA	11/5/21 8:00

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11/19/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 159412

Client ARCADIS Site Name

Cooler unpacked by: Mathew Suma

Cooler Received on 11/5/21 Opened on 11/5/21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: ~~Wet Ice~~ Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.6 °C Corrected Cooler Temp. 0.7 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# HC157842
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 01042016	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present?	Yes	(No)

JME 11-5-21

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

TB is not logged for SIM due to insufficient volume.
JME 11-5-21

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container.
Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.
Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

DATA VERIFICATION REPORT

November 19, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159412-1
Sample date: 2021-11-03
Report received by CADENA: 2021-11-19
Initial Data Verification completed by CADENA: 2021-11-19
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159412-1

		Sample Name:	TRIP BLANK_05				MW-185S_110321			
		Lab Sample ID:	2401594121				2401594122			
		Sample Date:	11/3/2021				11/3/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

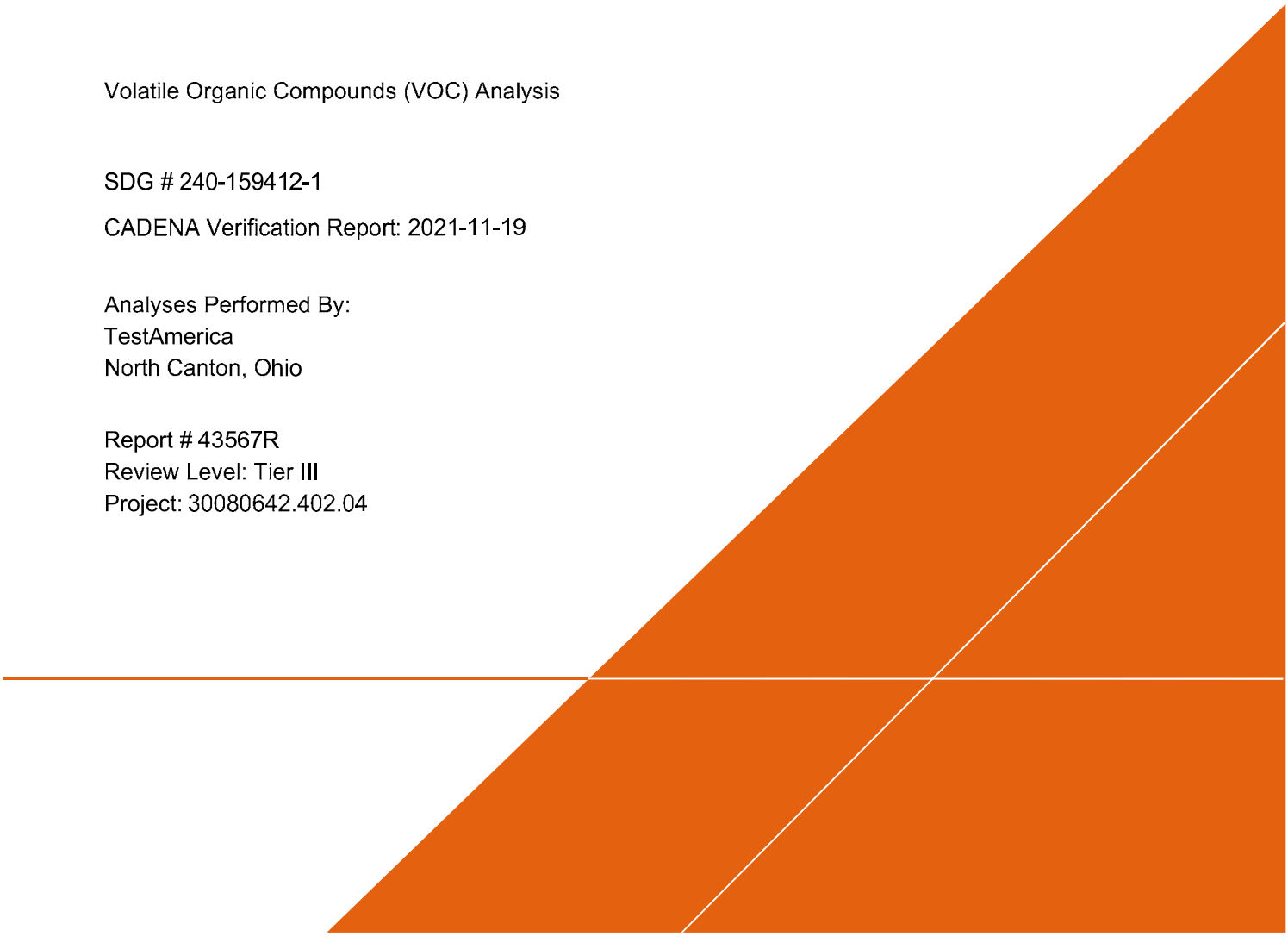
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159412-1

CADENA Verification Report: 2021-11-19

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43567R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159412-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_05	240-159412-1	Water	11/03/21		X	
MW-185S_110321	240-159412-2	Water	11/03/21		X	X

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE: 

DATE: December 07, 2021

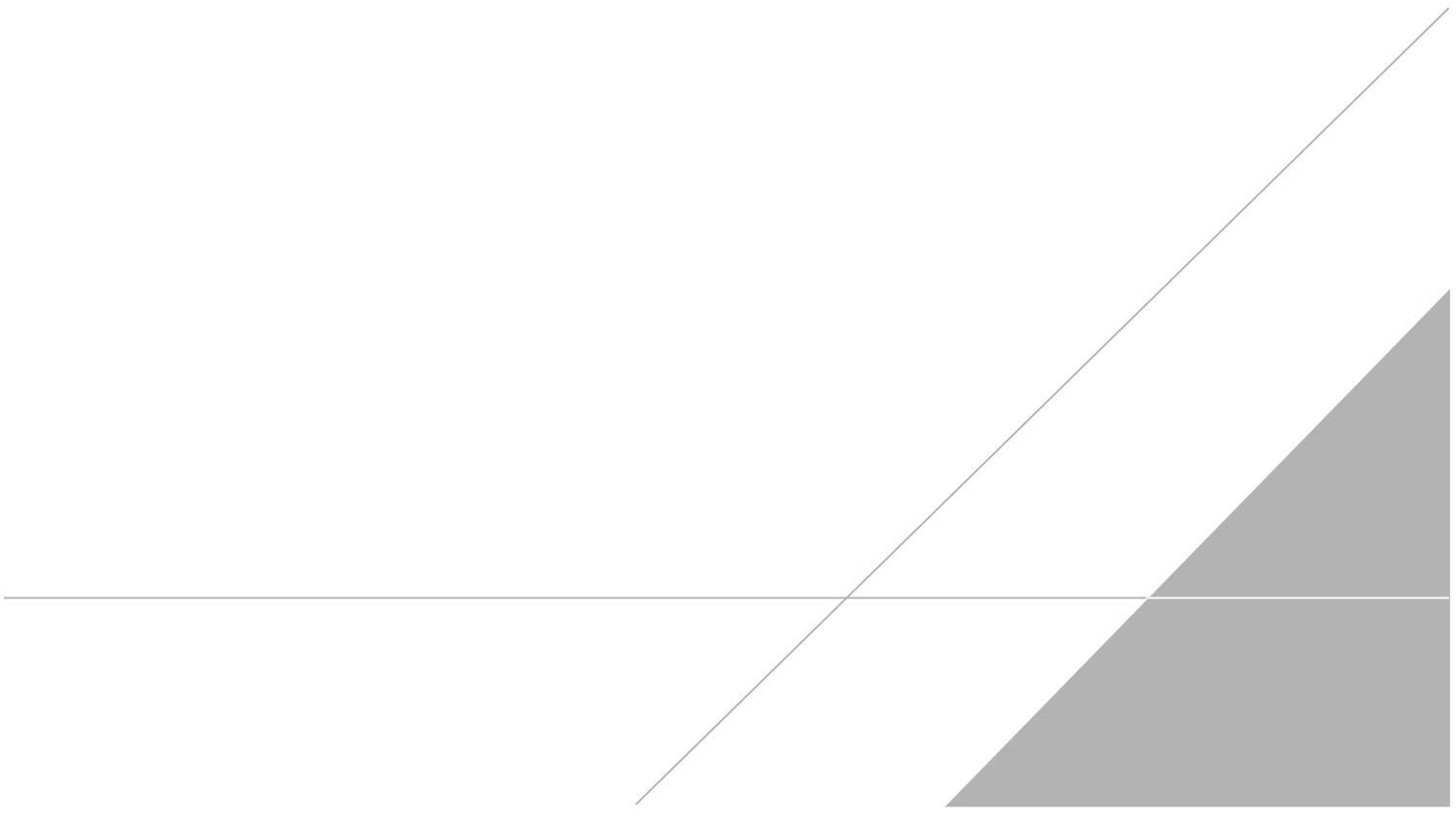
PEER REVIEW: Andrew Korycinski

DATE: December 8, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



MICHIGAN 190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Sommer Guy	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day (10 day)		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_05	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1855_110321	11/3/21	11:20		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159412 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ an Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For [ ] Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: Sommer Guy	Arcadis	11/3/21 16:00	Received by: Novi Cold Storage	Arcadis	11/3/21 16:00
Relinquished by: [signature]	ARCADIS	11/4/21 1040	Received by: Teri Hall	ETA	11/4/21 1041
Relinquished by: Teri Hall	ETA	11/4/21 1049	Received in Laboratory by: M. A. S.	ETA	11/5/21 8:00

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11/19/2021

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159412-1

Client Sample ID: TRIP BLANK_05
Date Collected: 11/03/21 00:00
Date Received: 11/05/21 08:00

Lab Sample ID: 240-159412-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 15:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 15:46	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 15:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 15:46	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 15:46	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 15:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/13/21 15:46*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/13/21 15:46*	*1*
Toluene-d8 (Surr)	*116*		*78 - 122*		*11/13/21 15:46*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/13/21 15:46*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159412-1

Client Sample ID: MW-185S_110321

Lab Sample ID: 240-159412-2

Date Collected: 11/03/21 11:20

Matrix: Water

Date Received: 11/05/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/11/21 21:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/11/21 21:03*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 16:09	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 16:09	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 16:09	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 16:09	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 16:09	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 16:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*		*11/13/21 16:09*	*1*
4-Bromofluorobenzene (Surr)	*86*		*56 - 136*		*11/13/21 16:09*	*1*
Toluene-d8 (Surr)	*113*		*78 - 122*		*11/13/21 16:09*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/13/21 16:09*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159717-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/24/2021 8:28:08 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159717-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159717-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159717-1

Comments
No additional comments.

Receipt
The samples were received on 11/10/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 0.7° C and 0.8° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159717-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159717-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159717-1	TRIP BLANK_95	Water	11/08/21 00:00	11/10/21 08:00
240-159717-2	MW-183S_110821	Water	11/08/21 12:16	11/10/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159717-1

Client Sample ID: TRIP BLANK_95 — Lab Sample ID: 240-159717-1

No Detections.

Client Sample ID: MW-183S_110821 — Lab Sample ID: 240-159717-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159717-1

Client Sample ID: TRIP BLANK_95
Date Collected: 11/08/21 00:00
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159717-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 18:17	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 18:17	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 18:17	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 18:17	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 18:17	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 18:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*62 - 137*		*11/17/21 18:17*	*1*
4-Bromofluorobenzene (Surr)	*66*		*56 - 136*		*11/17/21 18:17*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/17/21 18:17*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/17/21 18:17*	*1*

Client Sample ID: MW-183S_110821

Date Collected: 11/08/21 12:16
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159717-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 03:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*		*11/18/21 03:12*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 18:39	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 18:39	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 18:39	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 18:39	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 18:39	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 18:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*62 - 137*		*11/17/21 18:39*	*1*
4-Bromofluorobenzene (Surr)	*67*		*56 - 136*		*11/17/21 18:39*	*1*
Toluene-d8 (Surr)	*86*		*78 - 122*		*11/17/21 18:39*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/17/21 18:39*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159717-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159717-1	TRIP BLANK_95	116	66	89	99
240-159717-2	MW-183S_110821	116	67	86	102
240-159724-A-2 MS	Matrix Spike	96	99	103	84
240-159724-C-2 MSD	Matrix Spike Duplicate	97	97	106	86
LCS 240-513417/4	Lab Control Sample	93	97	98	84
MB 240-513417/7	Method Blank	105	76	89	91

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159636-H-2 MS	Matrix Spike	77
240-159636-N-2 MSD	Matrix Spike Duplicate	77
240-159717-2	MW-183S_110821	78
LCS 240-513479/4	Lab Control Sample	78
MB 240-513479/5	Method Blank	77

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513417/7
Matrix: Water
Analysis Batch: 513417

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 13:33	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 13:33	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 13:33	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 13:33	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 13:33	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 13:33	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/17/21 13:33*	*1*
4-Bromofluorobenzene (Surr)	*76*		*56 - 136*		*11/17/21 13:33*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/17/21 13:33*	*1*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*11/17/21 13:33*	*1*

Lab Sample ID: LCS 240-513417/4
Matrix: Water
Analysis Batch: 513417

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.24		ug/L		92	63 - 134
cis-1,2-Dichloroethene	10.0	9.72		ug/L		97	77 - 123
Tetrachloroethene	10.0	9.53		ug/L		95	76 - 123
trans-1,2-Dichloroethene	10.0	10.1		ug/L		101	75 - 124
Trichloroethene	10.0	8.80		ug/L		88	70 - 122
Vinyl chloride	10.0	11.6		ug/L		116	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*97*		*56 - 136*
Toluene-d8 (Surr)	*98*		*78 - 122*
Dibromofluoromethane (Surr)	*84*		*73 - 120*

Lab Sample ID: 240-159724-A-2 MS
Matrix: Water
Analysis Batch: 513417

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	8.39		ug/L		84	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	8.85		ug/L		88	66 - 128
Tetrachloroethene	1.0	U	10.0	8.96		ug/L		90	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.58		ug/L		96	56 - 136
Trichloroethene	1.0	U	10.0	7.89		ug/L		79	61 - 124
Vinyl chloride	2.8		10.0	14.2		ug/L		114	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*
4-Bromofluorobenzene (Surr)	*99*		*56 - 136*
Toluene-d8 (Surr)	*103*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159724-A-2 MS
Matrix: Water
Analysis Batch: 513417

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*84*		*73 - 120*

Lab Sample ID: 240-159724-C-2 MSD
Matrix: Water
Analysis Batch: 513417

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	7.80		ug/L		78	56 - 135	7	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.45		ug/L		95	66 - 128	7	14
Tetrachloroethene	1.0	U	10.0	9.27		ug/L		93	62 - 131	3	20
trans-1,2-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	56 - 136	8	15
Trichloroethene	1.0	U	10.0	8.32		ug/L		83	61 - 124	5	15
Vinyl chloride	2.8		10.0	15.8		ug/L		130	43 - 157	11	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*62 - 137*
4-Bromofluorobenzene (Surr)	*97*		*56 - 136*
Toluene-d8 (Surr)	*106*		*78 - 122*
Dibromofluoromethane (Surr)	*86*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513479/5
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 17:41	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*		*11/17/21 17:41*	*1*

Lab Sample ID: LCS 240-513479/4
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	11.9		ug/L		119	80 - 122		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*

Lab Sample ID: 240-159636-H-2 MS
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153		

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

Lab Sample ID: 240-159636-N-2 MSD
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153	0	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159717-1

GC/MS VOA

Analysis Batch: 513417

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159717-1	TRIP BLANK_95	Total/NA	Water	8260B	
240-159717-2	MW-183S_110821	Total/NA	Water	8260B	
MB 240-513417/7	Method Blank	Total/NA	Water	8260B	
LCS 240-513417/4	Lab Control Sample	Total/NA	Water	8260B	
240-159724-A-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159724-C-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 513479

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159717-2	MW-183S_110821	Total/NA	Water	8260B SIM	
MB 240-513479/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513479/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159636-H-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159636-N-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159717-1

Client Sample ID: TRIP BLANK_95

Lab Sample ID: 240-159717-1

Date Collected: 11/08/21 00:00

Matrix: Water

Date Received: 11/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513417	11/17/21 18:17	LEE	TAL CAN

Client Sample ID: MW-183S_110821

Lab Sample ID: 240-159717-2

Date Collected: 11/08/21 12:16

Matrix: Water

Date Received: 11/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513417	11/17/21 18:39	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513479	11/18/21 03:12	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159717-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

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Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day — 10 day		Walk-in client:
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM			Sample Specific Notes / Special Instructions:
TRIP BLANK_95	---	---		X						1					N	G	X	X	X	X	X	X	~~X~~ (EW)			1 Trip Blank
MW-1835_110821	11/08/21	1216		X						6					N	G	X	X	X	X	X	X	X			3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159717 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: Gary Schafer	Arcadis	11/08/21	1630	Received by: Novi Cold Storage	Arcadis	11/08/21	1630
Relinquished by: Chantal Allen	ARCADIS	11/9/21	1040	Received by: Jeri Heal	ETA	11/9/21	1040
Relinquished by: Jeri Heal	ETA	11/9/21	1055	Received in Laboratory by: Marybeth Block	ETA	11-10-21	8:00

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11/24/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159717**
Canton Facility

Client Arcadis Site Name

Cooler Received on 11-10-21 Opened on 11-10-21

Cooler unpacked by: Marilyn Beal

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: ~~Bubble Wrap~~ Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon ~~receipt~~ ☒ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity_____	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC157842
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ~~Trip B~~	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

NO SIM on TB per Corrected COC. DMF 11/10/21

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) Trip Blank - 95 were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

Login # : 159717

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form				
Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
(TA) Client Box Other	(IR-14) IR-15	0-6	0-7	(Wet Ice) Blue Ice Dry Ice Water None
(TA) Client Box Other	(IR-14) IR-15	0-7	0-8	(Wet Ice) Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice

DATA VERIFICATION REPORT

November 25, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159717-1
Sample date: 2021-11-08
Report received by CADENA: 2021-11-24
Initial Data Verification completed by CADENA: 2021-11-25
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159717-1

		Sample Name:	TRIP BLANK_95				MW-183S_110821			
		Lab Sample ID:	2401597171				2401597172			
		Sample Date:	11/8/2021				11/8/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

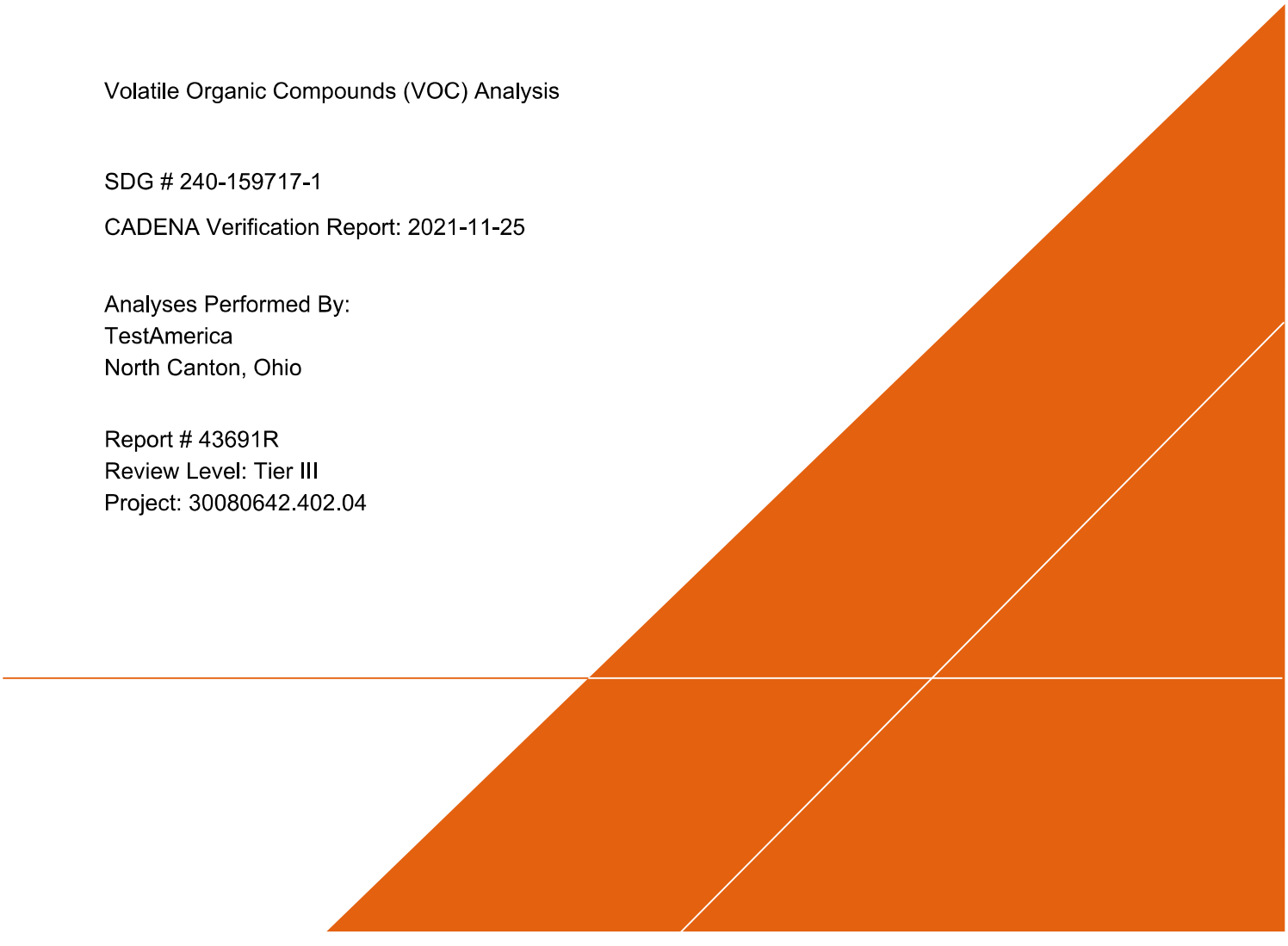
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159717-1

CADENA Verification Report: 2021-11-25

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43691R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159717-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_95	240-159717-1	Water	11/08/21		X	
MW-183S_110821	240-159717-2	Water	11/08/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 13, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Gary Schafer	TAT if different from below: 10 day; ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM			Sample Specific Notes / Special Instructions:
TRIP BLANK_95	---	---		X						1					N	G	X	X	X	X	X	X	~~X~~ (EW)			1 Trip Blank
MW-1835_110821	11/08/21	1216		X						6					N	G	X	X	X	X	X	X	X			3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159717 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	11/08/21 1630	Novi Cold Storage	Arcadis	11/08/21 1630
Charlotte Allen	ARCADIS	11/9/21 1040	Jeri Heal	EA	11/9/21 1040
Jeri Heal	EA	11/9/21 1055	Marybeth Block	EA	11-10-21 8:00

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11/24/2021

Client Sample ID: TRIP BLANK_95
Lab Sample ID: 240-159717-1
Date Collected: 11/08/21 00:00
Matrix: Water
Date Received: 11/10/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 18:17	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 18:17	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 18:17	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 18:17	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 18:17	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 18:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*62 - 137*		*11/17/21 18:17*	*1*
4-Bromofluorobenzene (Surr)	*66*		*56 - 136*		*11/17/21 18:17*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/17/21 18:17*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/17/21 18:17*	*1*

Client Sample ID: MW-183S_110821
Lab Sample ID: 240-159717-2
Date Collected: 11/08/21 12:16
Matrix: Water
Date Received: 11/10/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 03:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*		*11/18/21 03:12*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 18:39	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 18:39	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 18:39	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 18:39	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 18:39	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 18:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*62 - 137*		*11/17/21 18:39*	*1*
4-Bromofluorobenzene (Surr)	*67*		*56 - 136*		*11/17/21 18:39*	*1*
Toluene-d8 (Surr)	*86*		*78 - 122*		*11/17/21 18:39*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/17/21 18:39*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159844-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/26/2021 7:57:53 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159844-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159844-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159844-1

Comments
No additional comments.

Receipt
The samples were received on 11/11/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 4.6° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159844-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159844-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159844-1	TRIP BLANK_104	Water	11/09/21 00:00	11/11/21 08:00
240-159844-2	MW-217S_110921	Water	11/09/21 14:26	11/11/21 08:00
240-159844-3	MW-112S_110921	Water	11/09/21 15:31	11/11/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159844-1

Client Sample ID: TRIP BLANK_104 — Lab Sample ID: 240-159844-1

No Detections.

Client Sample ID: MW-217S_110921 — Lab Sample ID: 240-159844-2

No Detections.

Client Sample ID: MW-112S_110921 — Lab Sample ID: 240-159844-3

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159844-1

Client Sample ID: TRIP BLANK_104
Date Collected: 11/09/21 00:00
Date Received: 11/11/21 08:00

Lab Sample ID: 240-159844-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 17:13	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 17:13	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 17:13	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 17:13	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 17:13	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 17:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/18/21 17:13*	*1*
4-Bromofluorobenzene (Surr)	*83*		*56 - 136*		*11/18/21 17:13*	*1*
Toluene-d8 (Surr)	*92*		*78 - 122*		*11/18/21 17:13*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/18/21 17:13*	*1*

Client Sample ID: MW-217S_110921

Date Collected: 11/09/21 14:26
Date Received: 11/11/21 08:00

Lab Sample ID: 240-159844-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/13/21 01:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*66 - 120*		*11/13/21 01:59*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 19:43	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 19:43	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 19:43	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 19:43	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 19:43	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 19:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*62 - 137*		*11/18/21 19:43*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/18/21 19:43*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*11/18/21 19:43*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/18/21 19:43*	*1*

Client Sample ID: MW-112S_110921

Date Collected: 11/09/21 15:31
Date Received: 11/11/21 08:00

Lab Sample ID: 240-159844-3

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 18:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*11/12/21 18:53*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 15:01	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 15:01	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 15:01	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 15:01	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 15:01	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 15:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*62 - 137*		*11/19/21 15:01*	*1*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*		*11/19/21 15:01*	*1*
Toluene-d8 (Surr)	*92*		*78 - 122*		*11/19/21 15:01*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*11/19/21 15:01*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159844-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
Lab Sample ID	Client Sample ID	DCA (62-137)	BFB (56-136)	TOL (78-122)	DBFM (73-120)
240-159844-1	TRIP BLANK_104	92	83	92	98
240-159844-2	MW-217S_110921	94	82	95	99
240-159844-3	MW-112S_110921	87	85	92	95
240-159848-C-3 MSD	Matrix Spike Duplicate	83	91	96	93
240-159848-D-3 MS	Matrix Spike	82	90	94	91
240-159848-E-3 MS	Matrix Spike	89	93	92	95
240-159848-E-3 MSD	Matrix Spike Duplicate	86	95	94	94
LCS 240-513621/5	Lab Control Sample	87	90	95	94
LCS 240-513835/5	Lab Control Sample	84	89	95	92
MB 240-513621/8	Method Blank	90	84	93	99
MB 240-513835/8	Method Blank	88	85	93	96

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	DCA (66-120)
240-159541-G-2 MS	Matrix Spike	77
240-159541-M-2 MSD	Matrix Spike Duplicate	78
240-159543-G-3 MS	Matrix Spike	85
240-159543-O-3 MSD	Matrix Spike Duplicate	83
240-159844-2	MW-217S_110921	79
240-159844-3	MW-112S_110921	83
LCS 240-512758/4	Lab Control Sample	83
LCS 240-512785/4	Lab Control Sample	79
MB 240-512758/5	Method Blank	84
MB 240-512785/5	Method Blank	79

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513621/8
Matrix: Water
Analysis Batch: 513621

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 15:31	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 15:31	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 15:31	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 15:31	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 15:31	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 15:31	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*		*11/18/21 15:31*	*1*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*		*11/18/21 15:31*	*1*
Toluene-d8 (Surr)	*93*		*78 - 122*		*11/18/21 15:31*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/18/21 15:31*	*1*

Lab Sample ID: LCS 240-513621/5
Matrix: Water
Analysis Batch: 513621

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	26.8		ug/L		107	63 - 134
cis-1,2-Dichloroethene	25.0	24.6		ug/L		99	77 - 123
Tetrachloroethene	25.0	26.5		ug/L		106	76 - 123
trans-1,2-Dichloroethene	25.0	25.6		ug/L		102	75 - 124
Trichloroethene	25.0	25.5		ug/L		102	70 - 122
Vinyl chloride	25.0	20.1		ug/L		81	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*87*		*62 - 137*
4-Bromofluorobenzene (Surr)	*90*		*56 - 136*
Toluene-d8 (Surr)	*95*		*78 - 122*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: 240-159848-E-3 MS
Matrix: Water
Analysis Batch: 513621

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	2.0	U	50.0	52.2		ug/L		104	56 - 135
cis-1,2-Dichloroethene	2.0	U	50.0	52.0		ug/L		104	66 - 128
Tetrachloroethene	2.0	U	50.0	56.8		ug/L		114	62 - 131
trans-1,2-Dichloroethene	2.0	U	50.0	51.2		ug/L		102	56 - 136
Trichloroethene	2.0	U	50.0	51.9		ug/L		104	61 - 124
Vinyl chloride	2.0	U	50.0	41.8		ug/L		84	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*62 - 137*
4-Bromofluorobenzene (Surr)	*93*		*56 - 136*
Toluene-d8 (Surr)	*92*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159848-E-3 MS
Matrix: Water
Analysis Batch: 513621

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*95*		*73 - 120*

Lab Sample ID: 240-159848-E-3 MSD
Matrix: Water
Analysis Batch: 513621

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	2.0	U	50.0	49.7		ug/L		99	56 - 135	5	26
cis-1,2-Dichloroethene	2.0	U	50.0	48.6		ug/L		97	66 - 128	7	14
Tetrachloroethene	2.0	U	50.0	55.3		ug/L		111	62 - 131	3	20
trans-1,2-Dichloroethene	2.0	U	50.0	48.6		ug/L		97	56 - 136	5	15
Trichloroethene	2.0	U	50.0	49.9		ug/L		100	61 - 124	4	15
Vinyl chloride	2.0	U	50.0	38.6		ug/L		77	43 - 157	8	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*
4-Bromofluorobenzene (Surr)	*95*		*56 - 136*
Toluene-d8 (Surr)	*94*		*78 - 122*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: MB 240-513835/8
Matrix: Water
Analysis Batch: 513835

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 13:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 13:46	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 13:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 13:46	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 13:46	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 13:46	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*62 - 137*		*11/19/21 13:46*	*1*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*		*11/19/21 13:46*	*1*
Toluene-d8 (Surr)	*93*		*78 - 122*		*11/19/21 13:46*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/19/21 13:46*	*1*

Lab Sample ID: LCS 240-513835/5
Matrix: Water
Analysis Batch: 513835

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,1-Dichloroethene			25.0	25.7		ug/L		103	63 - 134		
cis-1,2-Dichloroethene			25.0	24.4		ug/L		97	77 - 123		
Tetrachloroethene			25.0	26.4		ug/L		106	76 - 123		
trans-1,2-Dichloroethene			25.0	24.7		ug/L		99	75 - 124		
Trichloroethene			25.0	25.5		ug/L		102	70 - 122		

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-513835/5
Matrix: Water
Analysis Batch: 513835

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Vinyl chloride			25.0	18.3		ug/L		73	60 - 144		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*62 - 137*
4-Bromofluorobenzene (Surr)	*89*		*56 - 136*
Toluene-d8 (Surr)	*95*		*78 - 122*
Dibromofluoromethane (Surr)	*92*		*73 - 120*

Lab Sample ID: 240-159848-C-3 MSD
Matrix: Water
Analysis Batch: 513835

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	25.0	26.0		ug/L		104	56 - 135	2	26
cis-1,2-Dichloroethene	1.0	U	25.0	26.1		ug/L		104	66 - 128	4	14
Tetrachloroethene	0.45	J	25.0	25.9		ug/L		102	62 - 131	1	20
trans-1,2-Dichloroethene	1.0	U	25.0	25.5		ug/L		102	56 - 136	2	15
Trichloroethene	1.0	U	25.0	26.1		ug/L		104	61 - 124	2	15
Vinyl chloride	0.57	J	25.0	21.0		ug/L		82	43 - 157	4	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*62 - 137*
4-Bromofluorobenzene (Surr)	*91*		*56 - 136*
Toluene-d8 (Surr)	*96*		*78 - 122*
Dibromofluoromethane (Surr)	*93*		*73 - 120*

Lab Sample ID: 240-159848-D-3 MS
Matrix: Water
Analysis Batch: 513835

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	25.0	25.4		ug/L		102	56 - 135
cis-1,2-Dichloroethene	1.0	U	25.0	25.1		ug/L		100	66 - 128
Tetrachloroethene	0.45	J	25.0	25.6		ug/L		100	62 - 131
trans-1,2-Dichloroethene	1.0	U	25.0	24.9		ug/L		100	56 - 136
Trichloroethene	1.0	U	25.0	25.6		ug/L		102	61 - 124
Vinyl chloride	0.57	J	25.0	20.2		ug/L		79	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*62 - 137*
4-Bromofluorobenzene (Surr)	*90*		*56 - 136*
Toluene-d8 (Surr)	*94*		*78 - 122*
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512758/5
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 16:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/12/21 16:51*	*1*

Lab Sample ID: LCS 240-512758/4
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	9.63		ug/L		96	80 - 122		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

Lab Sample ID: 240-159543-G-3 MS
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U F1	10.0	9.98		ug/L		100	51 - 153		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

Lab Sample ID: 240-159543-O-3 MSD
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.71		ug/L		97	51 - 153	3	16

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

Lab Sample ID: MB 240-512785/5
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 18:32	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*66 - 120*		*11/12/21 18:32*	*1*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-512785/4
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.7		ug/L		107	80 - 122		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*66 - 120*

Lab Sample ID: 240-159541-G-2 MS
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

Lab Sample ID: 240-159541-M-2 MSD
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.4		ug/L		104	51 - 153	2	16

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*

GC/MS VOA

Analysis Batch: 512758

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159844-3	MW-112S_110921	Total/NA	Water	8260B SIM	
MB 240-512758/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512758/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159543-G-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159543-O-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 512785

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159844-2	MW-217S_110921	Total/NA	Water	8260B SIM	
MB 240-512785/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512785/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159541-G-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159541-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513621

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159844-1	TRIP BLANK_104	Total/NA	Water	8260B	
240-159844-2	MW-217S_110921	Total/NA	Water	8260B	
MB 240-513621/8	Method Blank	Total/NA	Water	8260B	
LCS 240-513621/5	Lab Control Sample	Total/NA	Water	8260B	
240-159848-E-3 MS	Matrix Spike	Total/NA	Water	8260B	
240-159848-E-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 513835

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159844-3	MW-112S_110921	Total/NA	Water	8260B	
MB 240-513835/8	Method Blank	Total/NA	Water	8260B	
LCS 240-513835/5	Lab Control Sample	Total/NA	Water	8260B	
240-159848-C-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	
240-159848-D-3 MS	Matrix Spike	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159844-1

Client Sample ID: TRIP BLANK_104

Lab Sample ID: 240-159844-1

Date Collected: 11/09/21 00:00

Matrix: Water

Date Received: 11/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513621	11/18/21 17:13	SAM	TAL CAN

Client Sample ID: MW-217S_110921

Lab Sample ID: 240-159844-2

Date Collected: 11/09/21 14:26

Matrix: Water

Date Received: 11/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513621	11/18/21 19:43	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	512785	11/13/21 01:59	CS	TAL CAN

Client Sample ID: MW-112S_110921

Lab Sample ID: 240-159844-3

Date Collected: 11/09/21 15:31

Matrix: Water

Date Received: 11/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513835	11/19/21 15:01	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	512758	11/12/21 18:53	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159844-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

45/46

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	For lab use only
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		Walk-in client
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: 10 day; ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30080642.402.04	Shipping/Tracking No:			
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_104	---	---		X						1							X	X	X	X	X	X	X	1 Trip Blank
MW-217S_110921	11/09/21	1426		X						6					N	C	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-112S_110921	11/09/21	1531		X						6					N	C	X	X	X	X	X	X	X	

240-159844 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com, Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: Gary Schafer	Arcadis	11/10/21	8:36	Received by: Novi cold storage	Arcadis 11/10/21 8:36
Relinquished by: Julia McClafferty	Arcadis	11/10/21		Received by:	GTA 11/10/21 1036
Relinquished by:	GTA	11/10/21	1045	Received in Laboratory by: Tammy Berger	ETA 11-11-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159844**
Canton Facility

Client Arcadis Site Name

Cooler unpacked by: Tammy Depp

Cooler Received on 11-11-21 Opened on 11-11-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # 1A Foam Box Client Cooler Box Other

Packing material used: ~~Bubble Wrap~~ Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 4.5 °C Corrected Cooler Temp. 4.6 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# **HC157842**
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 60358	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

No SIM on TB per Corrected COC. 11/11/21

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

November 26, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159844-1
Sample date: 2021-11-09
Report received by CADENA: 2021-11-26
Initial Data Verification completed by CADENA: 2021-11-26
Number of Samples:3
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159844-1

		Sample Name:	TRIP BLANK_104				MW-217S_110921				MW-112S_110921			
		Lab Sample ID:	2401598441				2401598442				2401598443			
		Sample Date:	11/9/2021				11/9/2021				11/9/2021			
Analyte	Cas No.		Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC														
OSW-8260B														
1,1-Dichloroethene	75-35-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim														
1,4-Dioxane	123-91-1						ND	2.0	ug/l	---	ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

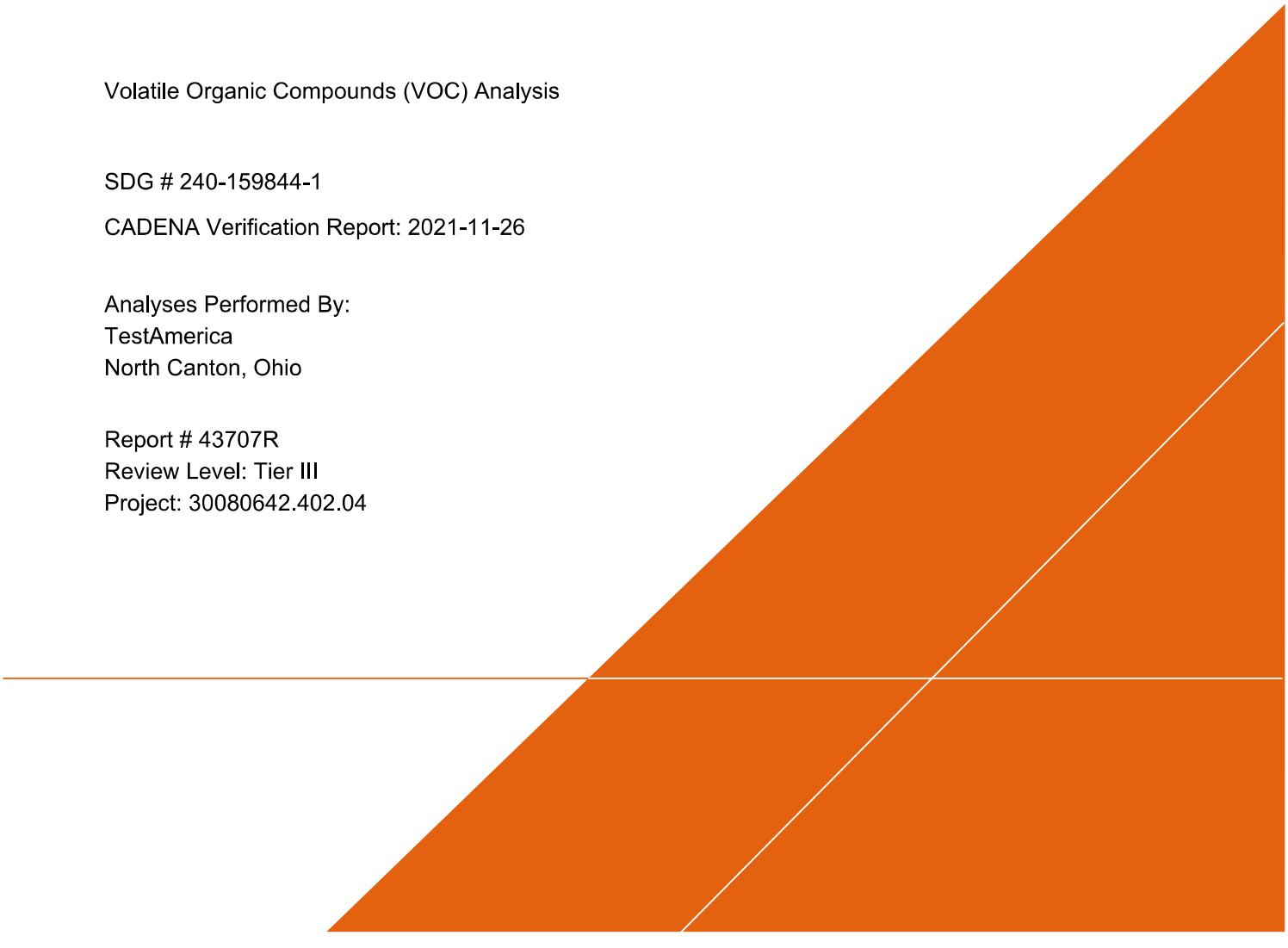
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159844-1

CADENA Verification Report: 2021-11-26

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43707R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159844-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_104	240-159844-1	Water	11/09/21		X	
MW-217S_110921	240-159844-2	Water	11/09/21		X	X
MW-112S_110921	240-159844-3	Water	11/09/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 14, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 14, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190

Chain of Custody Record

9/5/46

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Gary Schafer	TAT if different from below: 10 day ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_104	---	---		X						1							X	X	X	X	X	X	X	1 Trip Blank
MW-2175-110921	11/09/21	1426		X						6					N	C	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-1125-110921	11/09/21	1531		X						6					N	C	X	X	X	X	X	X	X	

240-159844 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com, Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: Gary Schafer	Arcadis	11/10/21	8:36 Received by: Novi cold storage	Arcadis	11/10/21 8:36
Relinquished by: Julia McClafferty	Arcadis	11/10/21	Received by:	GTA	11/10/21 1036
Relinquished by:	GTA	11/10/21	1045 Received in Laboratory by: Tammy Berger	ETA	11-11-21 800

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11/26/2021

Client Sample ID: TRIP BLANK_104
Lab Sample ID: 240-159844-1
Date Collected: 11/09/21 00:00
Matrix: Water
Date Received: 11/11/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 17:13	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 17:13	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 17:13	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 17:13	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 17:13	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 17:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/18/21 17:13*	*1*
4-Bromofluorobenzene (Surr)	*83*		*56 - 136*		*11/18/21 17:13*	*1*
Toluene-d8 (Surr)	*92*		*78 - 122*		*11/18/21 17:13*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/18/21 17:13*	*1*

Client Sample ID: MW-217S_110921
Lab Sample ID: 240-159844-2
Date Collected: 11/09/21 14:26
Matrix: Water
Date Received: 11/11/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/13/21 01:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*66 - 120*		*11/13/21 01:59*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 19:43	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 19:43	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 19:43	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 19:43	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 19:43	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 19:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*62 - 137*		*11/18/21 19:43*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/18/21 19:43*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*11/18/21 19:43*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/18/21 19:43*	*1*

Client Sample ID: MW-112S_110921
Lab Sample ID: 240-159844-3
Date Collected: 11/09/21 15:31
Matrix: Water
Date Received: 11/11/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 18:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*11/12/21 18:53*	*1*

Client Sample ID: MW-112S_110921
Lab Sample ID: 240-159844-3

Date Collected: 11/09/21 15:31
Matrix: Water
Date Received: 11/11/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 15:01	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 15:01	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 15:01	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 15:01	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 15:01	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 15:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*62 - 137*		*11/19/21 15:01*	*1*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*		*11/19/21 15:01*	*1*
Toluene-d8 (Surr)	*92*		*78 - 122*		*11/19/21 15:01*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*11/19/21 15:01*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159413-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/19/2021 1:47:18 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
Review your project results through TotalAccess
Have a Question? Ask The Expert
Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159413-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159413-1

Job ID: 240-159413-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159413-1

Comments
No additional comments.

Receipt
The samples were received on 11/5/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.7º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159413-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159413-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159413-1	TRIP BLANK_07	Water	11/03/21 00:00	11/05/21 08:00
240-159413-2	MW-89S_110321	Water	11/03/21 15:05	11/05/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159413-1

Client Sample ID: TRIP BLANK_07 — Lab Sample ID: 240-159413-1

No Detections.

Client Sample ID: MW-89S_110321 — Lab Sample ID: 240-159413-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	1.8		1.0	0.46	ug/L	1		8260B	Total/NA
Vinyl chloride	0.69	J	1.0	0.45	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159413-1

Client Sample ID: TRIP BLANK_07
Date Collected: 11/03/21 00:00
Date Received: 11/05/21 08:00

Lab Sample ID: 240-159413-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 16:31	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 16:31	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 16:31	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 16:31	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 16:31	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 16:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*62 - 137*		*11/13/21 16:31*	*1*
4-Bromofluorobenzene (Surr)	*77*		*56 - 136*		*11/13/21 16:31*	*1*
Toluene-d8 (Surr)	*106*		*78 - 122*		*11/13/21 16:31*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/13/21 16:31*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159413-1

Client Sample ID: MW-89S_110321
Date Collected: 11/03/21 15:05
Date Received: 11/05/21 08:00

Lab Sample ID: 240-159413-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/11/21 21:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*		*11/11/21 21:27*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 16:54	1
cis-1,2-Dichloroethene	**1.8**		1.0	0.46	ug/L			11/13/21 16:54	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 16:54	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 16:54	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 16:54	1
Vinyl chloride	**0.69**	**J**	1.0	0.45	ug/L			11/13/21 16:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*62 - 137*		*11/13/21 16:54*	*1*
4-Bromofluorobenzene (Surr)	*74*		*56 - 136*		*11/13/21 16:54*	*1*
Toluene-d8 (Surr)	*105*		*78 - 122*		*11/13/21 16:54*	*1*
Dibromofluoromethane (Surr)	*93*		*73 - 120*		*11/13/21 16:54*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159413-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159413-1	TRIP BLANK_07	94	77	106	94
240-159413-2	MW-89S_110321	94	74	105	93
240-159418-E-2 MS	Matrix Spike	93	87	106	94
240-159418-L-2 MSD	Matrix Spike Duplicate	90	87	107	91
LCS 240-512817/4	Lab Control Sample	90	89	112	90
MB 240-512817/6	Method Blank	98	81	112	98

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159413-2	MW-89S_110321	81
240-159418-H-2 MS	Matrix Spike	82
240-159418-P-2 MSD	Matrix Spike Duplicate	83
LCS 240-512585/4	Lab Control Sample	81
MB 240-512585/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512817/6
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 13:55	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 13:55	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:55	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 13:55	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:55	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 13:55	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*		*11/13/21 13:55*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/13/21 13:55*	*1*
Toluene-d8 (Surr)	*112*		*78 - 122*		*11/13/21 13:55*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/13/21 13:55*	*1*

Lab Sample ID: LCS 240-512817/4
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.9		ug/L		109	63 - 134
cis-1,2-Dichloroethene	10.0	10.3		ug/L		103	77 - 123
Tetrachloroethene	10.0	11.9		ug/L		119	76 - 123
trans-1,2-Dichloroethene	10.0	10.8		ug/L		108	75 - 124
Trichloroethene	10.0	9.19		ug/L		92	70 - 122
Vinyl chloride	10.0	9.48		ug/L		95	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*89*		*56 - 136*
Toluene-d8 (Surr)	*112*		*78 - 122*
Dibromofluoromethane (Surr)	*90*		*73 - 120*

Lab Sample ID: 240-159418-E-2 MS
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	10.3		ug/L		103	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.89		ug/L		99	66 - 128
Tetrachloroethene	1.0	U	10.0	9.53		ug/L		95	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.91		ug/L		99	56 - 136
Trichloroethene	1.0	U	10.0	8.16		ug/L		82	61 - 124
Vinyl chloride	1.0	U	10.0	9.96		ug/L		100	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*106*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159418-E-2 MS
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: 240-159418-L-2 MSD
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	10.0		ug/L		100	56 - 135	2	26
cis-1,2-Dichloroethene	1.0	U	10.0	10.1		ug/L		101	66 - 128	2	14
Tetrachloroethene	1.0	U	10.0	10.1		ug/L		101	62 - 131	5	20
trans-1,2-Dichloroethene	1.0	U	10.0	10.1		ug/L		101	56 - 136	2	15
Trichloroethene	1.0	U	10.0	8.61		ug/L		86	61 - 124	5	15
Vinyl chloride	1.0	U	10.0	10.2		ug/L		102	43 - 157	3	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*107*		*78 - 122*
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512585/5
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/11/21 19:04	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/11/21 19:04*	*1*

Lab Sample ID: LCS 240-512585/4
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	9.86		ug/L		99	80 - 122		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*

Lab Sample ID: 240-159418-H-2 MS
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U F1	10.0	11.1		ug/L		111	51 - 153		

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159418-P-2 MSD
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.2		ug/L		102	51 - 153	8	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159413-1

GC/MS VOA

Analysis Batch: 512585

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159413-2	MW-89S_110321	Total/NA	Water	8260B SIM	
MB 240-512585/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512585/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159418-H-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159418-P-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 512817

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159413-1	TRIP BLANK_07	Total/NA	Water	8260B	
240-159413-2	MW-89S_110321	Total/NA	Water	8260B	
MB 240-512817/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512817/4	Lab Control Sample	Total/NA	Water	8260B	
240-159418-E-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159418-L-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159413-1

Client Sample ID: TRIP BLANK_07

Lab Sample ID: 240-159413-1

Date Collected: 11/03/21 00:00

Matrix: Water

Date Received: 11/05/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512817	11/13/21 16:31	LEE	TAL CAN

Client Sample ID: MW-89S_110321

Lab Sample ID: 240-159413-2

Date Collected: 11/03/21 15:05

Matrix: Water

Date Received: 11/05/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512817	11/13/21 16:54	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512585	11/11/21 21:27	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159413-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Sommer Guy	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_07	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-895_110321	11/3/21	15:05		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159413 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by:	Arcadis	11/3/21 16:00	Received by: Novi Cold Storage	Arcadis	11/3/21 16:00
Relinquished by:	ARCADIS	11/4/21 1046	Received by:	ETA	11/4/21 1041
Relinquished by:	ETA	11/4/21 1049	Received in Laboratory by:	ETA	11/5/21 8:00

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 159413

Client ARCADIS Site Name

Cooler Received on 11/5/21 Opened on 11/5/21

Cooler unpacked by: Matthew Suma

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: ~~Wet Ice~~ Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.6 °C Corrected Cooler Temp. 0.7 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No	(NA) pH Strip Lot# HC157842
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present?	Yes	(No)

JWE 11-5-21

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

TB is not logged for SIM due to insufficient volume.
JWE 11-5-21

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.

Sample(s) were received in a broken container.

Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.

Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

DATA VERIFICATION REPORT

November 19, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159413-1
Sample date: 2021-11-03
Report received by CADENA: 2021-11-19
Initial Data Verification completed by CADENA: 2021-11-19
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159413-1

		Sample Name:	TRIP BLANK_07				MW-89S_110321			
		Lab Sample ID:	2401594131				2401594132			
		Sample Date:	11/3/2021				11/3/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	1.8	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	0.69	1.0	ug/l	J
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

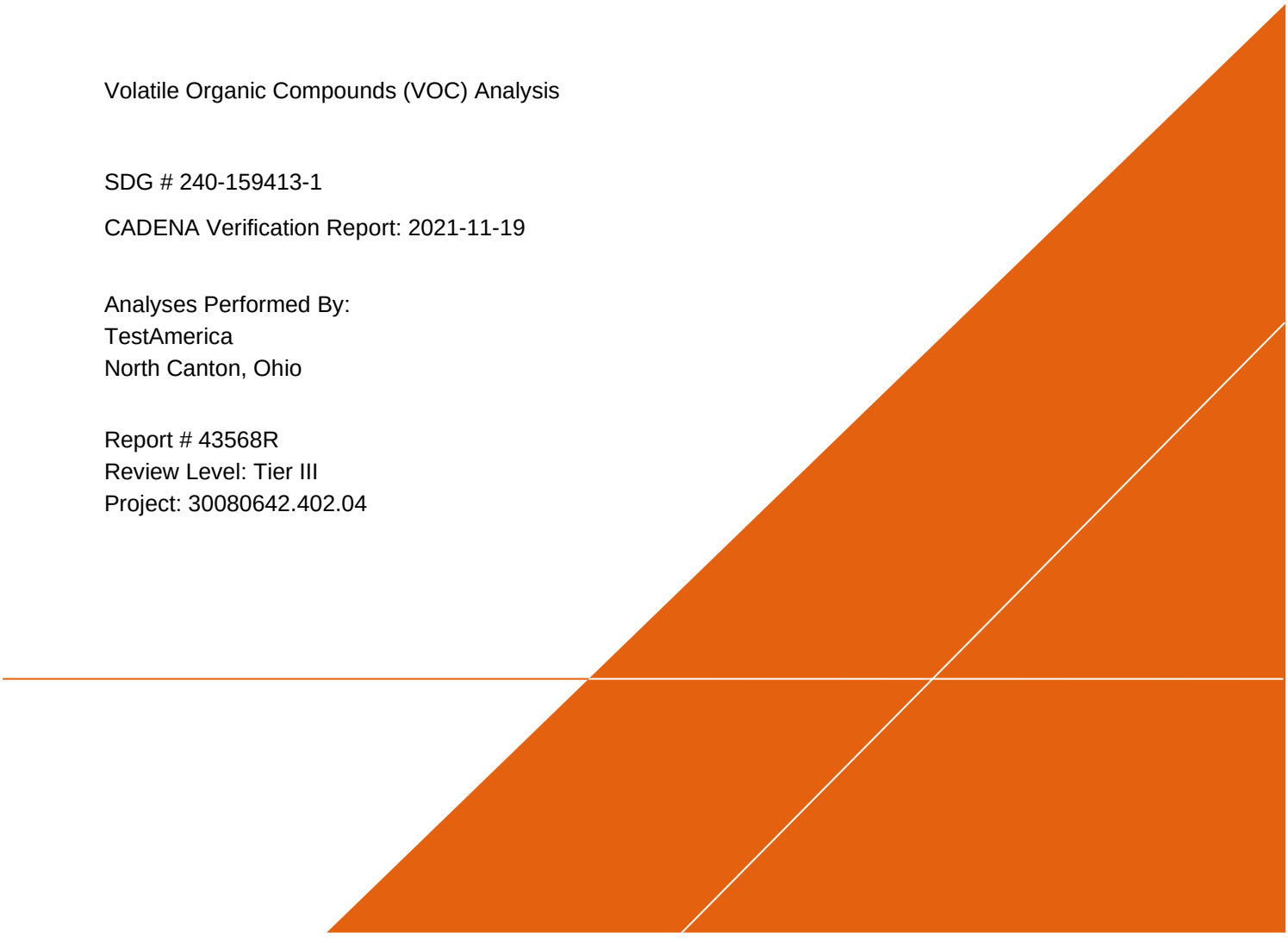
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159413-1

CADENA Verification Report: 2021-11-19

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43568R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159413-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_07	240-159413-1	Water	11/03/21		X	
MW-89S_110321	240-159413-2	Water	11/03/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE:

DATE: December 07, 2021

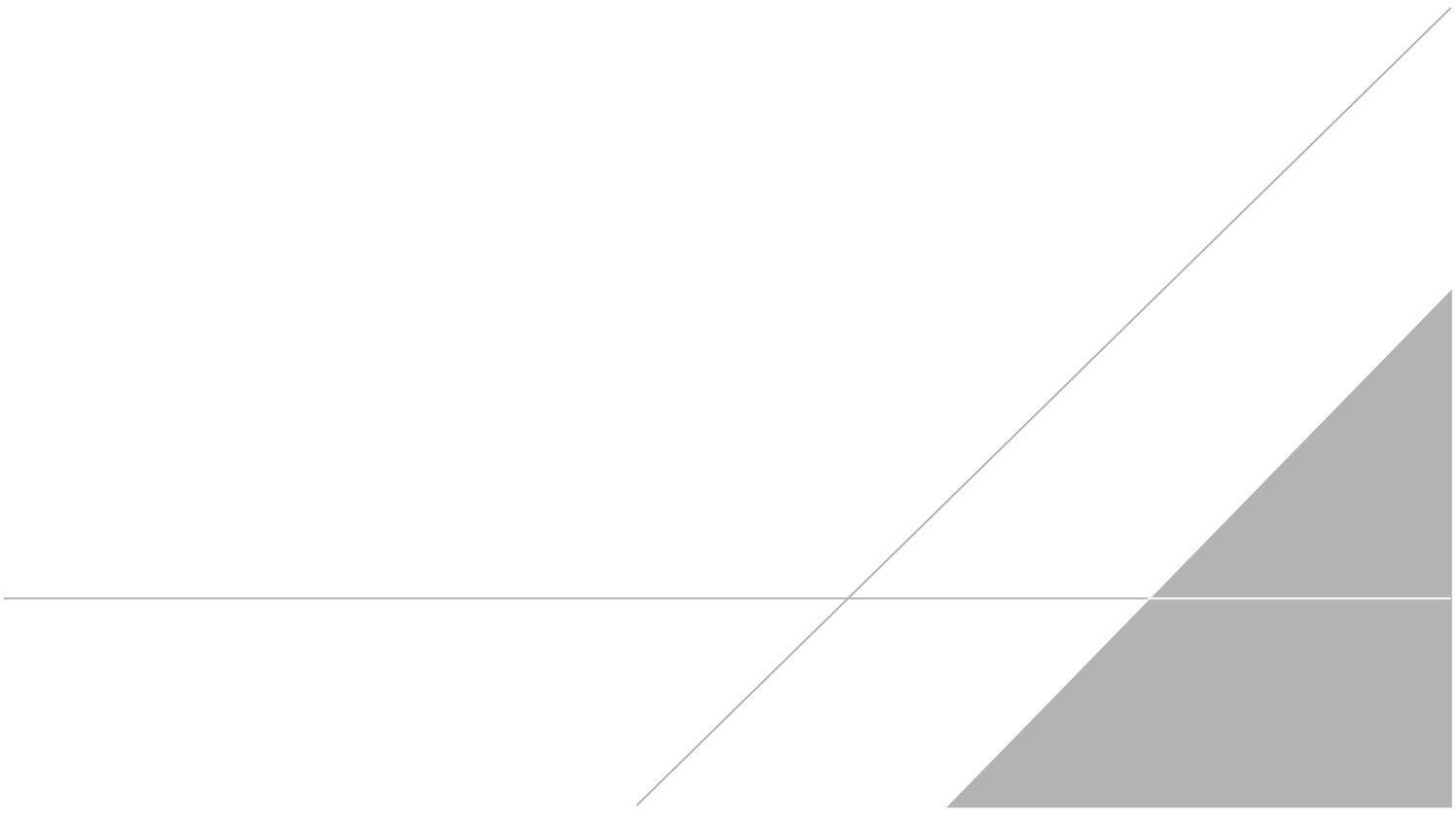
PEER REVIEW: Andrew Korycinski

DATE: December 8, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



MICHIGAN 190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Sommer Guy	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_07	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-895_110321	11/3/21	15:05		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159413 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by:	Arcadis	11/3/21 16:00	Received by: Novi Cold Storage	Arcadis	11/3/21 16:00
Relinquished by:	ARCADIS	11/4/21 1046	Received by:	ETA	11/4/21 1041
Relinquished by:	ETA	11/4/21 1049	Received in Laboratory by:	ETA	11/5/21 8:00

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11/19/2021

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159413-1

Client Sample ID: TRIP BLANK_07
Date Collected: 11/03/21 00:00
Date Received: 11/05/21 08:00

Lab Sample ID: 240-159413-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 16:31	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 16:31	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 16:31	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 16:31	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 16:31	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 16:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*62 - 137*		*11/13/21 16:31*	*1*
4-Bromofluorobenzene (Surr)	*77*		*56 - 136*		*11/13/21 16:31*	*1*
Toluene-d8 (Surr)	*106*		*78 - 122*		*11/13/21 16:31*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/13/21 16:31*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159413-1

Client Sample ID: MW-89S_110321
Date Collected: 11/03/21 15:05
Date Received: 11/05/21 08:00

Lab Sample ID: 240-159413-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/11/21 21:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*		*11/11/21 21:27*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 16:54	1
cis-1,2-Dichloroethene	**1.8**		1.0	0.46	ug/L			11/13/21 16:54	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 16:54	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 16:54	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 16:54	1
Vinyl chloride	**0.69**	**J**	1.0	0.45	ug/L			11/13/21 16:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*62 - 137*		*11/13/21 16:54*	*1*
4-Bromofluorobenzene (Surr)	*74*		*56 - 136*		*11/13/21 16:54*	*1*
Toluene-d8 (Surr)	*105*		*78 - 122*		*11/13/21 16:54*	*1*
Dibromofluoromethane (Surr)	*93*		*73 - 120*		*11/13/21 16:54*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159533-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/22/2021 9:29:29 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159533-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159533-1

Job ID: 240-159533-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159533-1

Comments
No additional comments.

Receipt
The samples were received on 11/6/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.1º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159533-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159533-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159533-1	TRIP BLANK_25	Water	11/04/21 00:00	11/06/21 08:00
240-159533-2	MW-193S_110421	Water	11/04/21 10:05	11/06/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159533-1

Client Sample ID: TRIP BLANK_25 — Lab Sample ID: 240-159533-1

No Detections.

Client Sample ID: MW-193S_110421 — Lab Sample ID: 240-159533-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159533-1

Client Sample ID: TRIP BLANK_25
Date Collected: 11/04/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159533-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 02:48	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 02:48	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 02:48	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 02:48	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 02:48	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 02:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*11/12/21 02:48*	*1*
4-Bromofluorobenzene (Surr)	*79*		*56 - 136*		*11/12/21 02:48*	*1*
Toluene-d8 (Surr)	*109*		*78 - 122*		*11/12/21 02:48*	*1*
Dibromofluoromethane (Surr)	*97*		*73 - 120*		*11/12/21 02:48*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159533-1

Client Sample ID: MW-193S_110421
Date Collected: 11/04/21 10:05
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159533-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 20:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*11/12/21 20:04*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 03:10	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 03:10	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 03:10	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 03:10	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 03:10	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 03:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/12/21 03:10*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/12/21 03:10*	*1*
Toluene-d8 (Surr)	*115*		*78 - 122*		*11/12/21 03:10*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/12/21 03:10*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159533-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159533-1	TRIP BLANK_25	96	79	109	97
240-159533-2	MW-193S_110421	99	82	115	99
240-159539-B-5 MS	Matrix Spike	96	94	116	97
240-159539-B-5 MSD	Matrix Spike Duplicate	90	87	108	92
LCS 240-512565/4	Lab Control Sample	89	87	107	90
MB 240-512565/6	Method Blank	92	73	102	90

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159533-2	MW-193S_110421	82
240-159543-G-3 MS	Matrix Spike	85
240-159543-O-3 MSD	Matrix Spike Duplicate	83
LCS 240-512758/4	Lab Control Sample	83
MB 240-512758/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512565/6
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 23:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 23:50	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 23:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 23:50	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 23:50	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 23:50	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/11/21 23:50*	*1*
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*11/11/21 23:50*	*1*
Toluene-d8 (Surr)	*102*		*78 - 122*		*11/11/21 23:50*	*1*
Dibromofluoromethane (Surr)	*90*		*73 - 120*		*11/11/21 23:50*	*1*

Lab Sample ID: LCS 240-512565/4
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.4		ug/L		104	63 - 134
cis-1,2-Dichloroethene	10.0	10.1		ug/L		101	77 - 123
Tetrachloroethene	10.0	10.6		ug/L		106	76 - 123
trans-1,2-Dichloroethene	10.0	10.1		ug/L		101	75 - 124
Trichloroethene	10.0	8.95		ug/L		90	70 - 122
Vinyl chloride	10.0	9.56		ug/L		96	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*107*		*78 - 122*
Dibromofluoromethane (Surr)	*90*		*73 - 120*

Lab Sample ID: 240-159539-B-5 MS
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25	U	250	224		ug/L		90	56 - 135
cis-1,2-Dichloroethene	43		250	285		ug/L		97	66 - 128
Tetrachloroethene	25	U	250	201		ug/L		80	62 - 131
trans-1,2-Dichloroethene	86		250	316		ug/L		92	56 - 136
Trichloroethene	830	F1	250	936	F1	ug/L		41	61 - 124
Vinyl chloride	25	U	250	246		ug/L		99	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*
Toluene-d8 (Surr)	*116*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159539-B-5 MS
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*97*		*73 - 120*

Lab Sample ID: 240-159539-B-5 MSD
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	25	U	250	213		ug/L		85	56 - 135	5	26
cis-1,2-Dichloroethene	43		250	272		ug/L		92	66 - 128	5	14
Tetrachloroethene	25	U	250	210		ug/L		84	62 - 131	4	20
trans-1,2-Dichloroethene	86		250	297		ug/L		84	56 - 136	6	15
Trichloroethene	830	F1	250	885	F1	ug/L		21	61 - 124	6	15
Vinyl chloride	25	U	250	233		ug/L		93	43 - 157	6	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*108*		*78 - 122*
Dibromofluoromethane (Surr)	*92*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512758/5
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 16:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/12/21 16:51*	*1*

Lab Sample ID: LCS 240-512758/4
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.63		ug/L		96	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

Lab Sample ID: 240-159543-G-3 MS
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	9.98		ug/L		100	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

Lab Sample ID: 240-159543-O-3 MSD
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.71		ug/L		97	51 - 153	3	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159533-1

GC/MS VOA

Analysis Batch: 512565

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159533-1	TRIP BLANK_25	Total/NA	Water	8260B	
240-159533-2	MW-193S_110421	Total/NA	Water	8260B	
MB 240-512565/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512565/4	Lab Control Sample	Total/NA	Water	8260B	
240-159539-B-5 MS	Matrix Spike	Total/NA	Water	8260B	
240-159539-B-5 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 512758

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159533-2	MW-193S_110421	Total/NA	Water	8260B SIM	
MB 240-512758/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512758/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159543-G-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159543-O-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159533-1

Client Sample ID: TRIP BLANK_25

Lab Sample ID: 240-159533-1

Date Collected: 11/04/21 00:00

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512565	11/12/21 02:48	LEE	TAL CAN

Client Sample ID: MW-193S_110421

Lab Sample ID: 240-159533-2

Date Collected: 11/04/21 10:05

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512565	11/12/21 03:10	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512758	11/12/21 20:04	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159533-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name:	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM			Sample Specific Notes / Special Instructions:
TRIP BLANK_25	—	—		X						1					N	G	X	X	X	X	X	X	(X)	(X)		1 Trip Blank
MW-193S-110421	1005	11/4/21		X						6					N	G	X	X	X	X	X	X	X			3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159533 Chain of Custody

Possible Hazard Identification
Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Return to Client; Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com Cadena #E203631
Level IV Reporting requested

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	11/4/21 / 1500	Novi cold storage	Arcadis	11/4/21 / 1500
Relinquished by: [signature]	Company: ARCADIS	Date/Time: 11/5/21 / 1435	Received by: [signature]	Company: ETA	Date/Time: 11/5/21 1435
Relinquished by: [signature]	Company: ETA	Date/Time: 11/5/21 1446	Received in Laboratory by: [signature]	Company: ETA	Date/Time: 11/6/21 8 00

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11/22/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 159533

Client ARCADIS Site Name

Cooler Received on 11/6/21 Opened on 11/6/21

Cooler unpacked by: Matthew Surma

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 1.0 °C Corrected Cooler Temp. 1.1 °C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2 Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3 Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13 Were all preserved sample(s) at the correct pH upon receipt?	Yes No	(NA) pH Strip Lot# HC157842
14 Were VOAs on the COC?	(Yes)	No
15 Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this	Yes	(No) NA
16 Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 0104201G	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present?	Yes	(No)

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.

Sample(s) were received in a broken container.

Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory

Time preserved: Preservative(s) added/Lot number(s).

VOA Sample Preservation - Date/Time VOAs Frozen.

DATA VERIFICATION REPORT

November 22, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159533-1
Sample date: 2021-11-04
Report received by CADENA: 2021-11-22
Initial Data Verification completed by CADENA: 2021-11-22
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

MS/MSD recovery outliers or sample duplicate RPD outliers were not determined using a client sample from this submittal for the test and QC batch noted so qualification was not required based on these sample-specific QC outliers:
GCMS VOC QC batch 512565.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159533-1

		Sample Name:	TRIP BLANK_25				MW-193S_110421			
		Lab Sample ID:	2401595331				2401595332			
		Sample Date:	11/4/2021				11/4/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

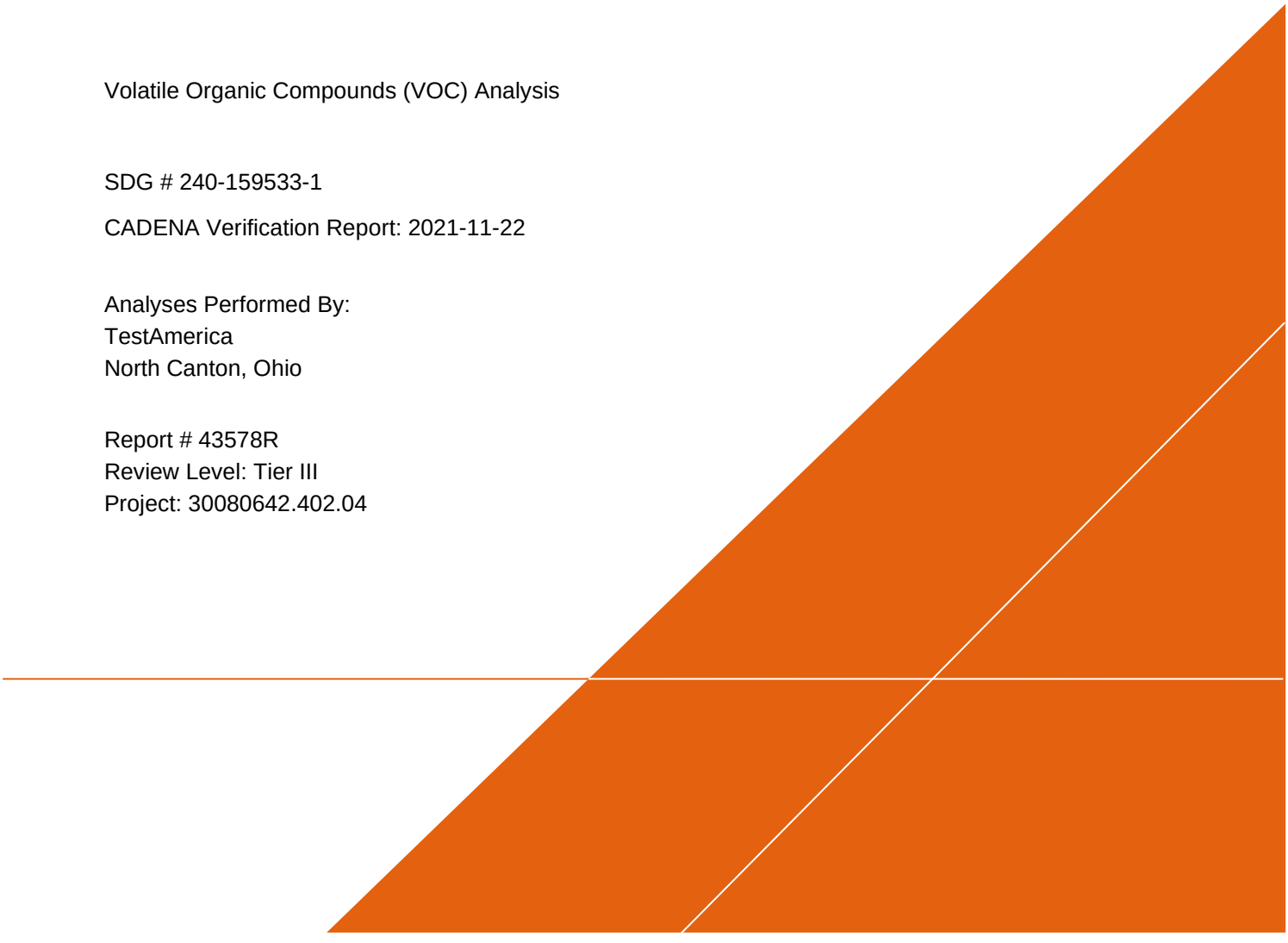
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159533-1

CADENA Verification Report: 2021-11-22

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43578R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159533-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_25	240-159533-1	Water	11/04/21		X	
MW-193S_110421	240-159533-2	Water	11/04/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

DATA REVIEW

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE:

DATE: December 07, 2021

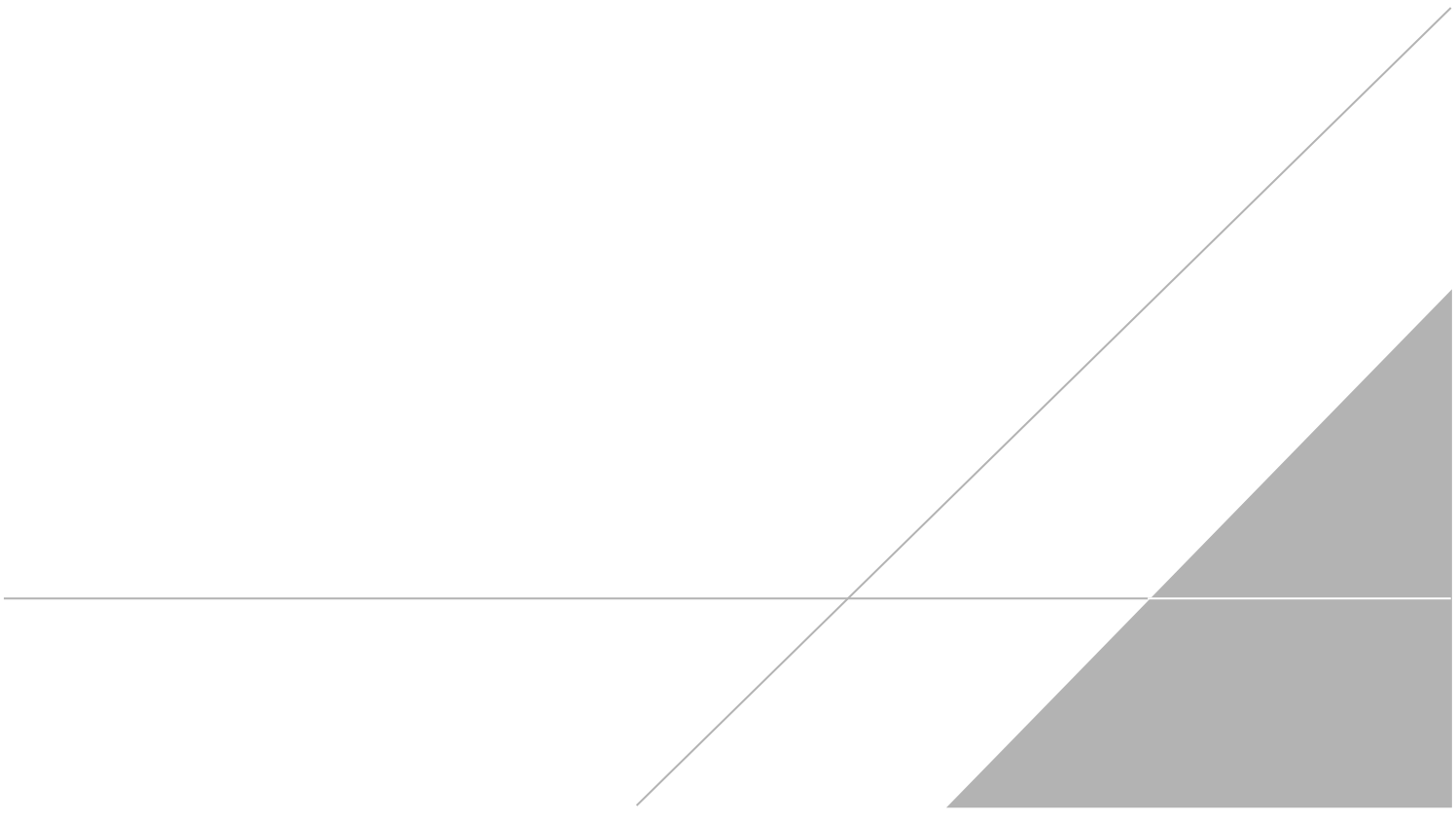
PEER REVIEW: Andrew Korycinski

DATE: December 8, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name:	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_25	—	—		X						1					N	G	X	X	X	X	X	X	(X)	1 Trip Blank
MW-193S-110421	1005	11/4/21		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159533 Chain of Custody

Possible Hazard Identification
Non-Hazard ☑ Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Return to Client ☑ Disposal By Lab Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com Cadena #E203631
Level IV Reporting requested

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	11/4/21 / 1500	Novi cold storage	Arcadis	11/4/21 / 1500
[signature]	ARCADIS	11/5/21 / 1435	[signature]	ETA	11/5/21 1435
[signature]	ETA	11/5/21 1446	Received in Laboratory by: [signature]	Company: ETA	Date/Time: 11/6/21 8 00

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11/22/2021

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159533-1

Client Sample ID: TRIP BLANK_25
Date Collected: 11/04/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159533-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 02:48	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 02:48	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 02:48	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 02:48	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 02:48	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 02:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*11/12/21 02:48*	*1*
4-Bromofluorobenzene (Surr)	*79*		*56 - 136*		*11/12/21 02:48*	*1*
Toluene-d8 (Surr)	*109*		*78 - 122*		*11/12/21 02:48*	*1*
Dibromofluoromethane (Surr)	*97*		*73 - 120*		*11/12/21 02:48*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159533-1

Client Sample ID: MW-193S_110421
Date Collected: 11/04/21 10:05
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159533-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 20:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*11/12/21 20:04*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 03:10	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 03:10	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 03:10	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 03:10	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 03:10	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 03:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/12/21 03:10*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/12/21 03:10*	*1*
Toluene-d8 (Surr)	*115*		*78 - 122*		*11/12/21 03:10*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/12/21 03:10*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159534-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/22/2021 9:29:54 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159534-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159534-1

Job ID: 240-159534-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159534-1

Comments
No additional comments.

Receipt
The samples were received on 11/6/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.1º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159534-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159534-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159534-1	TRIP BLANK_27	Water	11/04/21 00:00	11/06/21 08:00
240-159534-2	MW-158S_110421	Water	11/04/21 09:05	11/06/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159534-1

Client Sample ID: TRIP BLANK_27 — Lab Sample ID: 240-159534-1

No Detections.

Client Sample ID: MW-158S_110421 — Lab Sample ID: 240-159534-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159534-1

Client Sample ID: TRIP BLANK_27

Date Collected: 11/04/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159534-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 03:32	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 03:32	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 03:32	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 03:32	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 03:32	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 03:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/12/21 03:32*	*1*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*		*11/12/21 03:32*	*1*
Toluene-d8 (Surr)	*109*		*78 - 122*		*11/12/21 03:32*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/12/21 03:32*	*1*

Client Sample ID: MW-158S_110421
Date Collected: 11/04/21 09:05
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159534-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 20:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*		*11/12/21 20:28*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 03:54	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 03:54	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 03:54	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 03:54	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 03:54	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 03:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*62 - 137*		*11/12/21 03:54*	*1*
4-Bromofluorobenzene (Surr)	*75*		*56 - 136*		*11/12/21 03:54*	*1*
Toluene-d8 (Surr)	*104*		*78 - 122*		*11/12/21 03:54*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*11/12/21 03:54*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159534-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159534-1	TRIP BLANK_27	99	85	109	99
240-159534-2	MW-158S_110421	94	75	104	95
240-159539-B-5 MS	Matrix Spike	96	94	116	97
240-159539-B-5 MSD	Matrix Spike Duplicate	90	87	108	92
LCS 240-512565/4	Lab Control Sample	89	87	107	90
MB 240-512565/6	Method Blank	92	73	102	90

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159534-2	MW-158S_110421	81
240-159543-G-3 MS	Matrix Spike	85
240-159543-O-3 MSD	Matrix Spike Duplicate	83
LCS 240-512758/4	Lab Control Sample	83
MB 240-512758/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512565/6
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 23:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 23:50	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 23:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 23:50	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 23:50	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 23:50	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/11/21 23:50*	*1*
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*11/11/21 23:50*	*1*
Toluene-d8 (Surr)	*102*		*78 - 122*		*11/11/21 23:50*	*1*
Dibromofluoromethane (Surr)	*90*		*73 - 120*		*11/11/21 23:50*	*1*

Lab Sample ID: LCS 240-512565/4
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.4		ug/L		104	63 - 134
cis-1,2-Dichloroethene	10.0	10.1		ug/L		101	77 - 123
Tetrachloroethene	10.0	10.6		ug/L		106	76 - 123
trans-1,2-Dichloroethene	10.0	10.1		ug/L		101	75 - 124
Trichloroethene	10.0	8.95		ug/L		90	70 - 122
Vinyl chloride	10.0	9.56		ug/L		96	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*107*		*78 - 122*
Dibromofluoromethane (Surr)	*90*		*73 - 120*

Lab Sample ID: 240-159539-B-5 MS
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25	U	250	224		ug/L		90	56 - 135
cis-1,2-Dichloroethene	43		250	285		ug/L		97	66 - 128
Tetrachloroethene	25	U	250	201		ug/L		80	62 - 131
trans-1,2-Dichloroethene	86		250	316		ug/L		92	56 - 136
Trichloroethene	830	F1	250	936	F1	ug/L		41	61 - 124
Vinyl chloride	25	U	250	246		ug/L		99	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*
Toluene-d8 (Surr)	*116*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159539-B-5 MS
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*97*		*73 - 120*

Lab Sample ID: 240-159539-B-5 MSD
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	25	U	250	213		ug/L		85	56 - 135	5	26
cis-1,2-Dichloroethene	43		250	272		ug/L		92	66 - 128	5	14
Tetrachloroethene	25	U	250	210		ug/L		84	62 - 131	4	20
trans-1,2-Dichloroethene	86		250	297		ug/L		84	56 - 136	6	15
Trichloroethene	830	F1	250	885	F1	ug/L		21	61 - 124	6	15
Vinyl chloride	25	U	250	233		ug/L		93	43 - 157	6	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*108*		*78 - 122*
Dibromofluoromethane (Surr)	*92*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512758/5
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 16:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/12/21 16:51*	*1*

Lab Sample ID: LCS 240-512758/4
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.63		ug/L		96	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

Lab Sample ID: 240-159543-G-3 MS
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	9.98		ug/L		100	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

Lab Sample ID: 240-159543-O-3 MSD
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.71		ug/L		97	51 - 153	3	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159534-1

GC/MS VOA

Analysis Batch: 512565

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159534-1	TRIP BLANK_27	Total/NA	Water	8260B	
240-159534-2	MW-158S_110421	Total/NA	Water	8260B	
MB 240-512565/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512565/4	Lab Control Sample	Total/NA	Water	8260B	
240-159539-B-5 MS	Matrix Spike	Total/NA	Water	8260B	
240-159539-B-5 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 512758

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159534-2	MW-158S_110421	Total/NA	Water	8260B SIM	
MB 240-512758/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512758/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159543-G-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159543-O-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159534-1

Client Sample ID: TRIP BLANK_27

Lab Sample ID: 240-159534-1

Date Collected: 11/04/21 00:00

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512565	11/12/21 03:32	LEE	TAL CAN

Client Sample ID: MW-158S_110421

Lab Sample ID: 240-159534-2

Date Collected: 11/04/21 09:05

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512565	11/12/21 03:54	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512758	11/12/21 20:28	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159534-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	For lab use only
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		Walk-in client
Phone: 248-994-2240	Sampler Name: Seth Turner	TAT if different from below: 10 day; 3 weeks; ✓ 2 weeks; 1 week; 2 days; 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30080642.402.04	Shipping/Tracking No:			
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM				Sample Specific Notes / Special Instructions:
TRIP BLANK_27	—	—		X						1					N	G	X	X	X	X	X	X	X (w)				1 Trip Blank
MW-1585_110421	11/4/21	905		X						6					N	G	X	X	X	X	X	X	X				3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159534 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; ✓ Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Seth Turner	Arcadis	11/4/21 / 1500	Novi Cold Storage	Arcadis	11/4/21 / 1500
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	ARCADIS	11/5/21 / 1435	[signature]	ETA	11/5/21 1435
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
[signature]	ETA	11/5/21 1448	M.A.	ETA	11/6/21 8:00

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11/22/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 159534

Client ARCADIS Site Name _____

Cooler unpacked by: Matthew Surma

Cooler Received on 11/6/21 Opened on 11/6/21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 1.0 °C Corrected Cooler Temp. 1.1 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# HC157842
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 01042016 (Yes) No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by: _____

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

WI-NC-099

DATA VERIFICATION REPORT

November 22, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159534-1
Sample date: 2021-11-04
Report received by CADENA: 2021-11-22
Initial Data Verification completed by CADENA: 2021-11-22
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

MS/MSD recovery outliers or sample duplicate RPD outliers were not determined using a client sample from this submittal for the test and QC batch noted so qualification was not required based on these sample-specific QC outliers:
GCMS VOC QC batch 512565.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159534-1

		Sample Name:	TRIP BLANK_27				MW-158S_110421			
		Lab Sample ID:	2401595341				2401595342			
		Sample Date:	11/4/2021				11/4/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

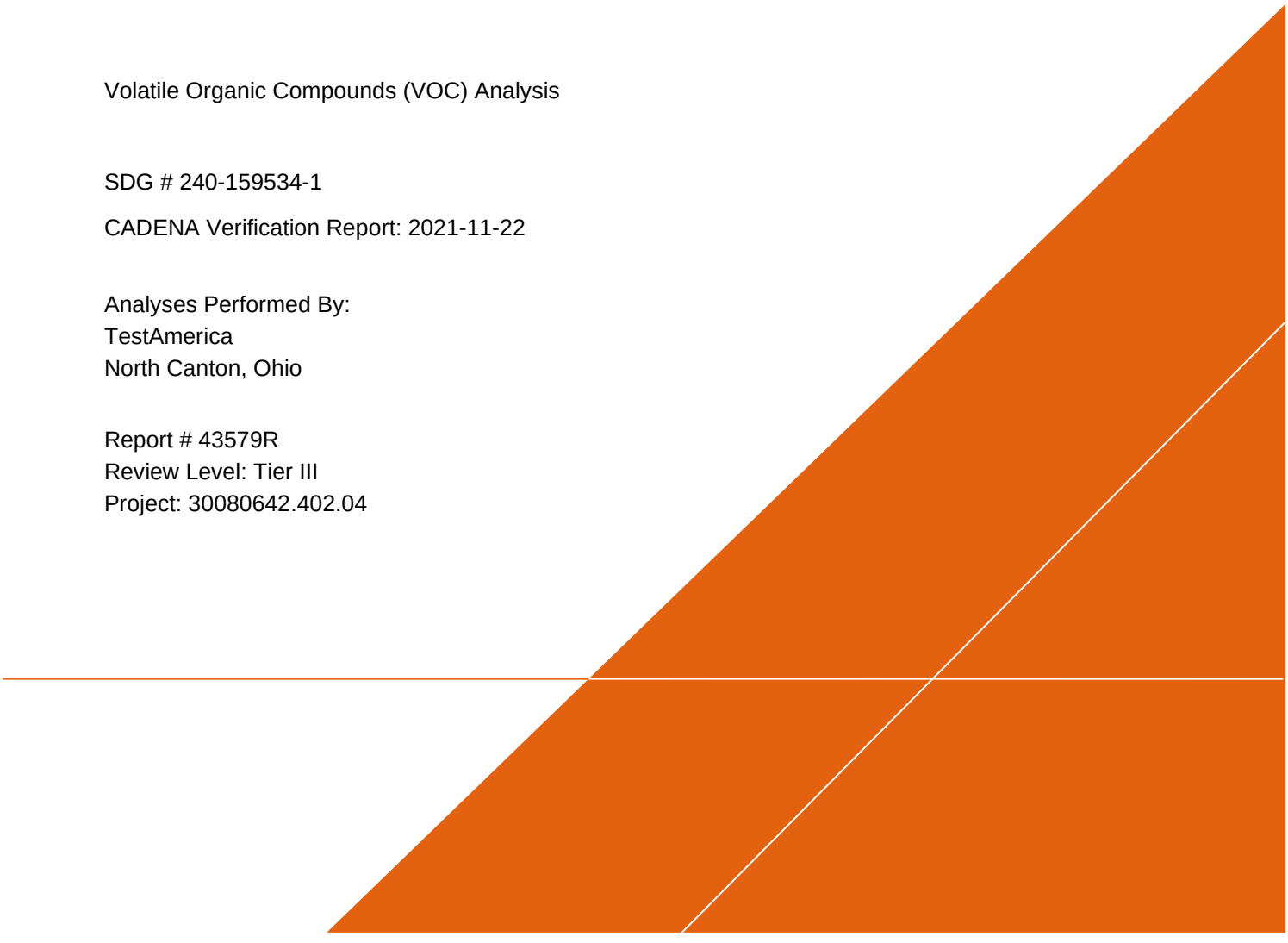
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159534-1

CADENA Verification Report: 2021-11-22

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43579R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159534-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_27	240-159534-1	Water	11/04/21		X	
MW-158S_110421	240-159534-2	Water	11/04/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

DATA REVIEW

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE:

DATE: December 07, 2021

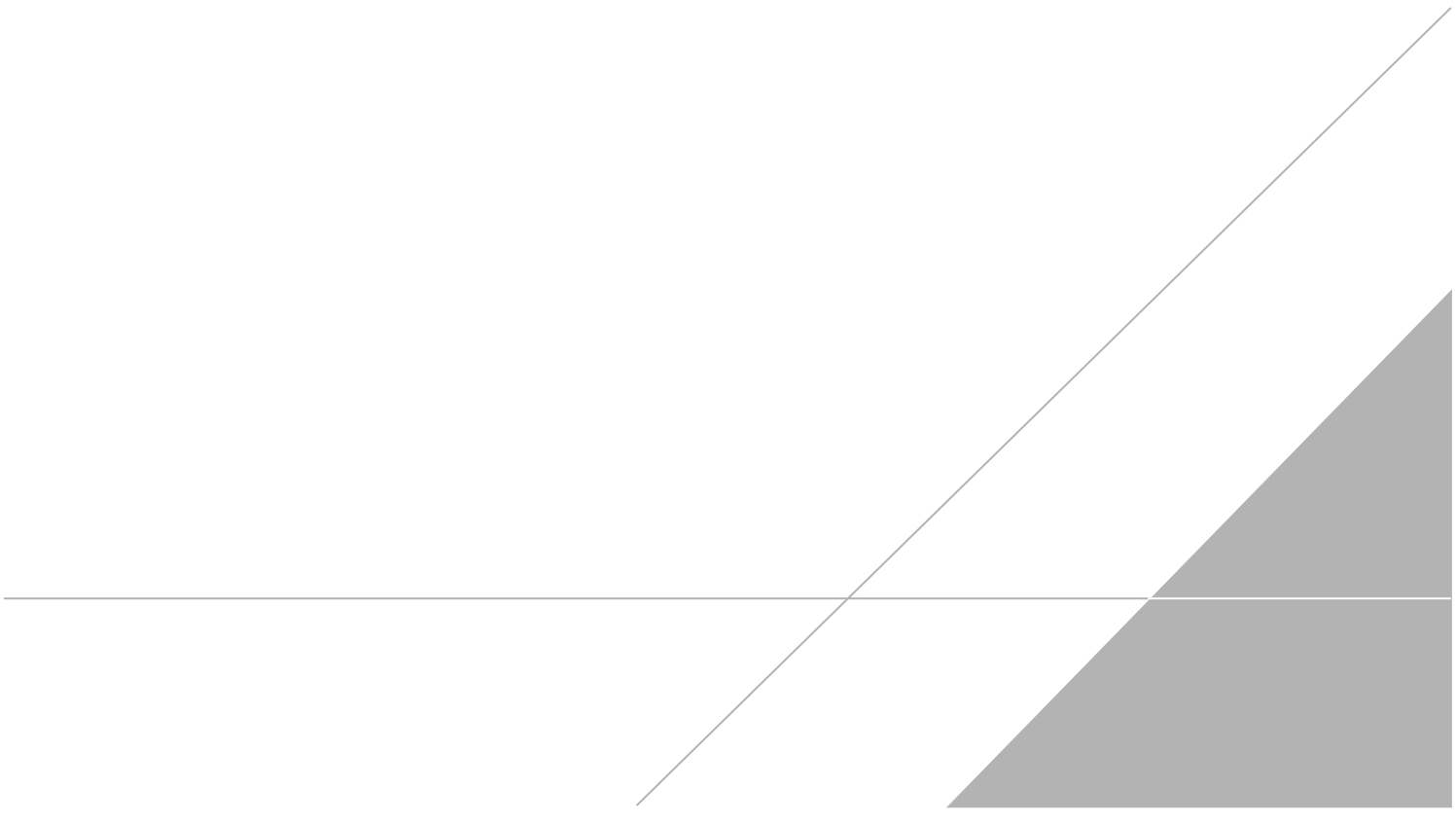
PEER REVIEW: Andrew Korycinski

DATE: December 8, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



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Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	For lab use only
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		Walk-in client
Phone: 248-994-2240	Sampler Name: Seth Turner	TAT if different from below: 10 day; 3 weeks; ✓ 2 weeks; 1 week; 2 days; 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30080642.402.04	Shipping/Tracking No:			
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM				Sample Specific Notes / Special Instructions:
TRIP BLANK_27	—	—		X						1					N	G	X	X	X	X	X	X	X (w)				1 Trip Blank
MW-1585-110421	11/4/21	905		X						6					N	G	X	X	X	X	X	X	X				3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159534 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; ✓ Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Seth Turner	Arcadis	11/4/21 / 1500	Novi Cold Storage	Arcadis	11/4/21 / 1500
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	ARCADIS	11/5/21 / 1435	[signature]	ETA	11/5/21 1435
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
[signature]	ETA	11/5/21 1448	M.A.	ETA	11/6/21 8:00

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11/22/2021

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159534-1

Client Sample ID: TRIP BLANK_27

Date Collected: 11/04/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159534-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 03:32	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 03:32	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 03:32	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 03:32	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 03:32	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 03:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/12/21 03:32*	*1*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*		*11/12/21 03:32*	*1*
Toluene-d8 (Surr)	*109*		*78 - 122*		*11/12/21 03:32*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/12/21 03:32*	*1*

Client Sample ID: MW-158S_110421
Date Collected: 11/04/21 09:05
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159534-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 20:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*		*11/12/21 20:28*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 03:54	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 03:54	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 03:54	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 03:54	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 03:54	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 03:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*62 - 137*		*11/12/21 03:54*	*1*
4-Bromofluorobenzene (Surr)	*75*		*56 - 136*		*11/12/21 03:54*	*1*
Toluene-d8 (Surr)	*104*		*78 - 122*		*11/12/21 03:54*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*11/12/21 03:54*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159828-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/26/2021 7:48:37 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159828-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159828-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159828-1

Comments
No additional comments.

Receipt
The samples were received on 11/11/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 4.6° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159828-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159828-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159828-1	TRIP BLANK_103	Water	11/09/21 00:00	11/11/21 08:00
240-159828-2	MW-88S_110921	Water	11/09/21 13:01	11/11/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159828-1

Client Sample ID: TRIP BLANK_103 — Lab Sample ID: 240-159828-1

No Detections.

Client Sample ID: MW-88S_110921 — Lab Sample ID: 240-159828-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159828-1

Client Sample ID: TRIP BLANK_103
Date Collected: 11/09/21 00:00
Date Received: 11/11/21 08:00

Lab Sample ID: 240-159828-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 06:03	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 06:03	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 06:03	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 06:03	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 06:03	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 06:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*115*		*62 - 137*		*11/19/21 06:03*	*1*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*		*11/19/21 06:03*	*1*
Toluene-d8 (Surr)	*102*		*78 - 122*		*11/19/21 06:03*	*1*
Dibromofluoromethane (Surr)	*105*		*73 - 120*		*11/19/21 06:03*	*1*

Client Sample ID: MW-88S_110921

Date Collected: 11/09/21 13:01
Date Received: 11/11/21 08:00

Lab Sample ID: 240-159828-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 21:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*		*11/12/21 21:50*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 06:25	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 06:25	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 06:25	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 06:25	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 06:25	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 06:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*115*		*62 - 137*		*11/19/21 06:25*	*1*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*		*11/19/21 06:25*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*11/19/21 06:25*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/19/21 06:25*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159828-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159828-1	TRIP BLANK_103	115	84	102	105
240-159828-2	MW-88S_110921	115	84	95	98
240-159830-D-2 MS	Matrix Spike	110	86	101	96
240-159830-E-2 MSD	Matrix Spike Duplicate	107	84	97	94
LCS 240-513667/4	Lab Control Sample	101	85	107	94
MB 240-513667/6	Method Blank	110	81	108	98

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159541-G-2 MS	Matrix Spike	77
240-159541-M-2 MSD	Matrix Spike Duplicate	78
240-159828-2	MW-88S_110921	77
LCS 240-512785/4	Lab Control Sample	79
MB 240-512785/5	Method Blank	79

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513667/6
Matrix: Water
Analysis Batch: 513667

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 23:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 23:24	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 23:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 23:24	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 23:24	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 23:24	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*62 - 137*		*11/18/21 23:24*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/18/21 23:24*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/18/21 23:24*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/18/21 23:24*	*1*

Lab Sample ID: LCS 240-513667/4
Matrix: Water
Analysis Batch: 513667

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.6		ug/L		106	63 - 134
cis-1,2-Dichloroethene	10.0	10.7		ug/L		107	77 - 123
Tetrachloroethene	10.0	12.0		ug/L		120	76 - 123
trans-1,2-Dichloroethene	10.0	10.6		ug/L		106	75 - 124
Trichloroethene	10.0	9.72		ug/L		97	70 - 122
Vinyl chloride	10.0	7.48		ug/L		75	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*101*		*62 - 137*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*
Toluene-d8 (Surr)	*107*		*78 - 122*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: 240-159830-D-2 MS
Matrix: Water
Analysis Batch: 513667

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	8.06		ug/L		81	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.32		ug/L		93	66 - 128
Tetrachloroethene	1.0	U	10.0	9.01		ug/L		90	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.50		ug/L		95	56 - 136
Trichloroethene	1.0	U	10.0	8.17		ug/L		82	61 - 124
Vinyl chloride	1.0	U	10.0	7.02		ug/L		70	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*110*		*62 - 137*
4-Bromofluorobenzene (Surr)	*86*		*56 - 136*
Toluene-d8 (Surr)	*101*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159830-D-2 MS
Matrix: Water
Analysis Batch: 513667

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*96*		*73 - 120*

Lab Sample ID: 240-159830-E-2 MSD
Matrix: Water
Analysis Batch: 513667

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	7.67		ug/L		77	56 - 135	5	26
cis-1,2-Dichloroethene	1.0	U	10.0	8.48		ug/L		85	66 - 128	9	14
Tetrachloroethene	1.0	U	10.0	8.29		ug/L		83	62 - 131	8	20
trans-1,2-Dichloroethene	1.0	U	10.0	8.31		ug/L		83	56 - 136	13	15
Trichloroethene	1.0	U	10.0	7.56		ug/L		76	61 - 124	8	15
Vinyl chloride	1.0	U	10.0	6.48		ug/L		65	43 - 157	8	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*107*		*62 - 137*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*
Toluene-d8 (Surr)	*97*		*78 - 122*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512785/5
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 18:32	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*66 - 120*		*11/12/21 18:32*	*1*

Lab Sample ID: LCS 240-512785/4
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.7		ug/L		107	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*66 - 120*

Lab Sample ID: 240-159541-G-2 MS
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

Lab Sample ID: 240-159541-M-2 MSD
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.4		ug/L		104	51 - 153	2	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*

GC/MS VOA

Analysis Batch: 512785

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159828-2	MW-88S_110921	Total/NA	Water	8260B SIM	
MB 240-512785/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512785/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159541-G-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159541-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513667

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159828-1	TRIP BLANK_103	Total/NA	Water	8260B	
240-159828-2	MW-88S_110921	Total/NA	Water	8260B	
MB 240-513667/6	Method Blank	Total/NA	Water	8260B	
LCS 240-513667/4	Lab Control Sample	Total/NA	Water	8260B	
240-159830-D-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159830-E-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159828-1

Client Sample ID: TRIP BLANK_103

Lab Sample ID: 240-159828-1

Date Collected: 11/09/21 00:00
Matrix: Water
Date Received: 11/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513667	11/19/21 06:03	LEE	TAL CAN

Client Sample ID: MW-88S_110921

Lab Sample ID: 240-159828-2

Date Collected: 11/09/21 13:01
Matrix: Water
Date Received: 11/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513667	11/19/21 06:25	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512785	11/12/21 21:50	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159828-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 180

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client: Lab sampling:
Phone: 248-994-2240	Method of Shipment/Carrier:			Job/SDG No:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM				Sample Specific Notes / Special Instructions:
TRIP BLANK_ 103	---	---		X						1							X	X	X	X	X	X	X				1 Trip Blank
MW-88S_110921	11/09/21	1301		X						6					N	G	X	X	X	X	X	X	X				3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159828 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: Gary Schafer	Arcadis	11/10/21 8:35	Received by: Novi cold storage	Arcadis	11/10/21 8:35
Relinquished by: Julia McClafferty	Arcadis	11/10/21 10:35	Received by:	GTI	11/10/21 1035
Relinquished by:	GTI	11/10/21 1041	Received in Laboratory by: Tammy Berger	Company: ETA	11-11-21 800

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11/26/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 154828
Canton Facility

Client Arcadis Site Name

Cooler Received on 11-11-21 Opened on 11-11-21

Cooler unpacked by: Tammy Berg

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # 1A Foam Box Client Cooler Box Other

Packing material used: ~~Bubble Wrap~~ Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 4.5 °C Corrected Cooler Temp. 4.6 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# HC157842
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # OQ3358 (Yes) No
17. Was a LL Hg or Me Hg trip blank present? Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

No SIM on TB per corrected COC. JME 11/11/21

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

November 26, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159828-1
Sample date: 2021-11-09
Report received by CADENA: 2021-11-26
Initial Data Verification completed by CADENA: 2021-11-26
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159828-1

		Sample Name:	TRIP BLANK_103				MW-88S_110921			
		Lab Sample ID:	2401598281				2401598282			
		Sample Date:	11/9/2021				11/9/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

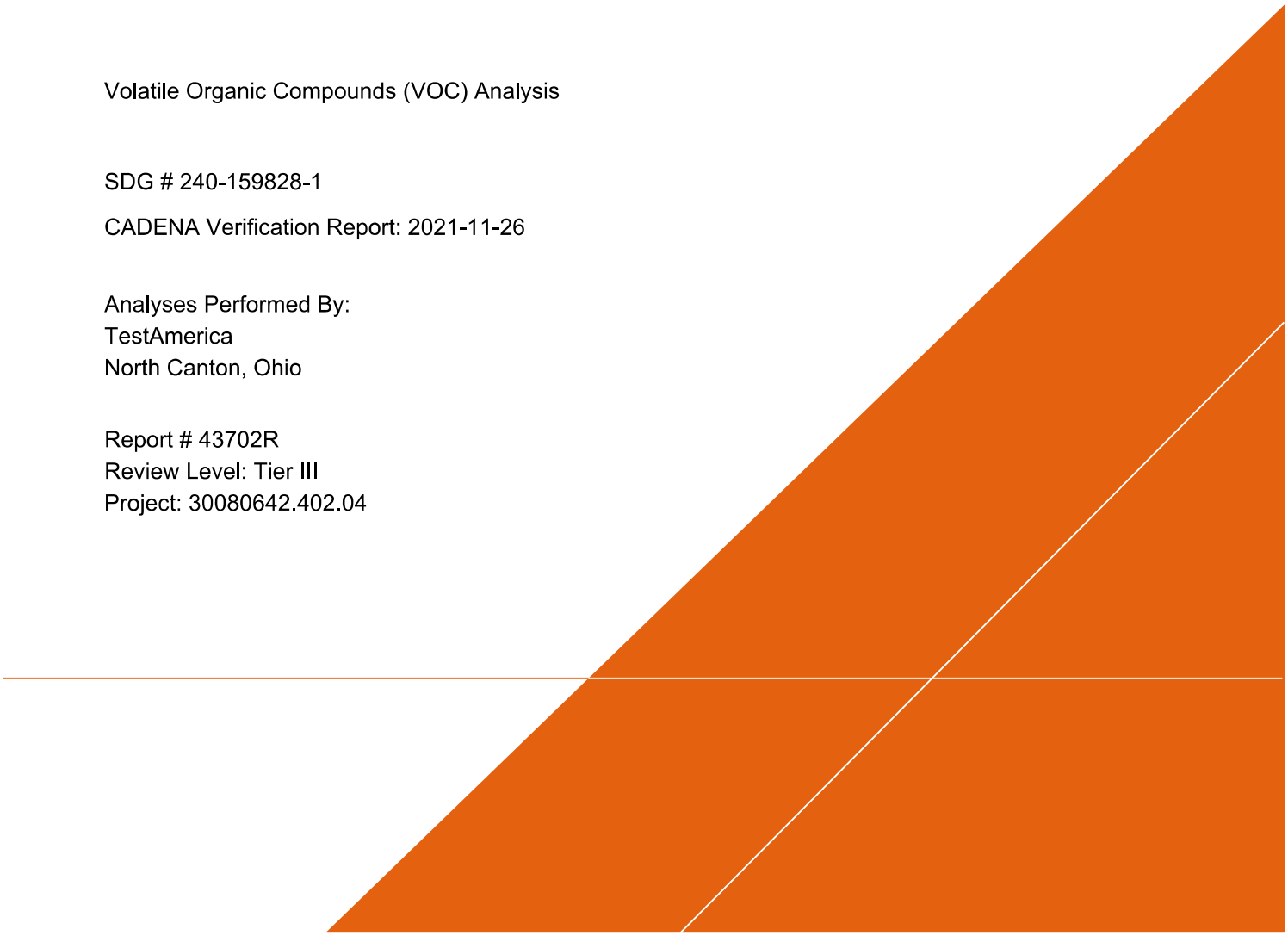
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159828-1

CADENA Verification Report: 2021-11-26

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43702R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159828-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_103	240-159828-1	Water	11/09/21		X	
MW-88S_110921	240-159828-2	Water	11/09/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 14, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 14, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 180

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☒ Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client; Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30080642.402.04	Shipping/Tracking No:			
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_103	---	---		X						1							X	X	X	X	X	X	X pm	1 Trip Blank
MW-33S_110921	11/09/21	1301		X						6					N	C	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159828 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com, Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: Gary Schafer	Arcadis	11/10/21 8:35	Received by: Novi cold storage	Arcadis	11/10/21 8:35
Relinquished by: Julia McClafferty	Arcadis	11/10/21 10:35	Received by:	GTI	11/10/21 1035
Relinquished by:	GTI	11/10/21 1041	Received in Laboratory by: Tammy Dreyer	ETA	11-11-21 800

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11/26/2021

Client Sample ID: TRIP BLANK_103
Lab Sample ID: 240-159828-1

Date Collected: 11/09/21 00:00
Matrix: Water
Date Received: 11/11/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 06:03	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 06:03	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 06:03	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 06:03	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 06:03	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 06:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*115*		*62 - 137*		*11/19/21 06:03*	*1*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*		*11/19/21 06:03*	*1*
Toluene-d8 (Surr)	*102*		*78 - 122*		*11/19/21 06:03*	*1*
Dibromofluoromethane (Surr)	*105*		*73 - 120*		*11/19/21 06:03*	*1*

Client Sample ID: MW-88S_110921
Lab Sample ID: 240-159828-2

Date Collected: 11/09/21 13:01
Matrix: Water
Date Received: 11/11/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 21:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*		*11/12/21 21:50*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 06:25	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 06:25	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 06:25	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 06:25	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 06:25	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 06:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*115*		*62 - 137*		*11/19/21 06:25*	*1*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*		*11/19/21 06:25*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*11/19/21 06:25*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/19/21 06:25*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159711-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/24/2021 8:23:21 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159711-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159711-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159711-1

Comments
No additional comments.

Receipt
The samples were received on 11/10/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 0.7° C and 0.8° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159711-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159711-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159711-1	TRIP BLANK_94	Water	11/08/21 00:00	11/10/21 08:00
240-159711-2	MW-126S_110821	Water	11/08/21 10:56	11/10/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159711-1

Client Sample ID: TRIP BLANK_94 — Lab Sample ID: 240-159711-1

No Detections.

Client Sample ID: MW-126S_110821 — Lab Sample ID: 240-159711-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159711-1

Client Sample ID: TRIP BLANK_94
Date Collected: 11/08/21 00:00
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159711-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 14:05	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 14:05	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 14:05	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 14:05	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 14:05	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 14:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*120*		*62 - 137*		*11/19/21 14:05*	*1*
4-Bromofluorobenzene (Surr)	*71*		*56 - 136*		*11/19/21 14:05*	*1*
Toluene-d8 (Surr)	*86*		*78 - 122*		*11/19/21 14:05*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*11/19/21 14:05*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159711-1

Client Sample ID: MW-126S_110821

Date Collected: 11/08/21 10:56
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159711-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 01:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*76*		*66 - 120*		*11/18/21 01:08*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 14:27	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 14:27	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 14:27	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 14:27	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 14:27	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 14:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*120*		*62 - 137*		*11/19/21 14:27*	*1*
4-Bromofluorobenzene (Surr)	*66*		*56 - 136*		*11/19/21 14:27*	*1*
Toluene-d8 (Surr)	*88*		*78 - 122*		*11/19/21 14:27*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/19/21 14:27*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159711-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159711-1	TRIP BLANK_94	120	71	86	95
240-159711-2	MW-126S_110821	120	66	88	101
LCS 240-513806/4	Lab Control Sample	98	94	104	84
MB 240-513806/7	Method Blank	112	76	91	92

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159636-H-2 MS	Matrix Spike	77
240-159636-N-2 MSD	Matrix Spike Duplicate	77
240-159711-2	MW-126S_110821	76
LCS 240-513479/4	Lab Control Sample	78
MB 240-513479/5	Method Blank	77

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513806/7
Matrix: Water
Analysis Batch: 513806

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 12:37	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 12:37	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 12:37	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 12:37	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 12:37	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 12:37	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*62 - 137*		*11/19/21 12:37*	*1*
4-Bromofluorobenzene (Surr)	*76*		*56 - 136*		*11/19/21 12:37*	*1*
Toluene-d8 (Surr)	*91*		*78 - 122*		*11/19/21 12:37*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*11/19/21 12:37*	*1*

Lab Sample ID: LCS 240-513806/4
Matrix: Water
Analysis Batch: 513806

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	7.99		ug/L		80	63 - 134
cis-1,2-Dichloroethene	10.0	9.65		ug/L		96	77 - 123
Tetrachloroethene	10.0	9.29		ug/L		93	76 - 123
trans-1,2-Dichloroethene	10.0	10.2		ug/L		102	75 - 124
Trichloroethene	10.0	8.38		ug/L		84	70 - 122
Vinyl chloride	10.0	8.94		ug/L		89	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*
Toluene-d8 (Surr)	*104*		*78 - 122*
Dibromofluoromethane (Surr)	*84*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513479/5
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 17:41	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*		*11/17/21 17:41*	*1*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-513479/4
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	11.9		ug/L		119	80 - 122		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*

Lab Sample ID: 240-159636-H-2 MS
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

Lab Sample ID: 240-159636-N-2 MSD
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153	0	16

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

GC/MS VOA

Analysis Batch: 513479

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159711-2	MW-126S_110821	Total/NA	Water	8260B SIM	
MB 240-513479/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513479/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159636-H-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159636-N-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513806

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159711-1	TRIP BLANK_94	Total/NA	Water	8260B	
240-159711-2	MW-126S_110821	Total/NA	Water	8260B	
MB 240-513806/7	Method Blank	Total/NA	Water	8260B	
LCS 240-513806/4	Lab Control Sample	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159711-1

Client Sample ID: TRIP BLANK_94

Lab Sample ID: 240-159711-1

Date Collected: 11/08/21 00:00

Matrix: Water

Date Received: 11/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513806	11/19/21 14:05	LEE	TAL CAN

Client Sample ID: MW-126S_110821

Lab Sample ID: 240-159711-2

Date Collected: 11/08/21 10:56

Matrix: Water

Date Received: 11/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513806	11/19/21 14:27	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513479	11/18/21 01:08	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159711-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN
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Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30080642.402.04				Job/SDG No:
PO # 30080642.402.04	Shipping/Tracking No:			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM				Sample Specific Notes / Special Instructions:
TRIP BLANK_94	---	---		X						1					N	G	X	X	X	X	X	X	X (DW)				1 Trip Blank
MW-1265_110821	11/08/21	10:56		X						6					N	G	X	X	X	X	X	X	X				3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159711 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	11/08/21 1625	Novi cold storage	Arcadis	11/08/21 1625
[redacted]	ARCADIS	11/9/21 1040	Jeri Hall	ETA	11/9/21 1040
Jeri Hall	ETA	11/9/21 1055	Mandilyn Block	ETA	11-10-21 8:00

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11/24/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** _____
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Marilyn Bloa

Cooler Received on 11-10-21 Opened on 11-10-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TB Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity_____	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC157842
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #_____	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

NO SIM on TB via Corrected COC

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

Login # : _____

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form					
Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)	
(TA) Client Box Other	(IR-14) IR-15	0.6	0.7	(Wet Ice) Blue Ice Dry Ice Water None	
(TA) Client Box Other	(IR-14) IR-15	0.7	0.8	(Wet Ice) Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
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TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
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TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
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TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None	
☐ See Temperature Excursion Form					

DATA VERIFICATION REPORT

November 25, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159711-1
Sample date: 2021-11-08
Report received by CADENA: 2021-11-24
Initial Data Verification completed by CADENA: 2021-11-25
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159711-1

		Sample Name:	TRIP BLANK_94				MW-126S_110821			
		Lab Sample ID:	2401597111				2401597112			
		Sample Date:	11/8/2021				11/8/2021			
	Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC										
	OSW-8260B									
	1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	OSW-8260BBSim									
	1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

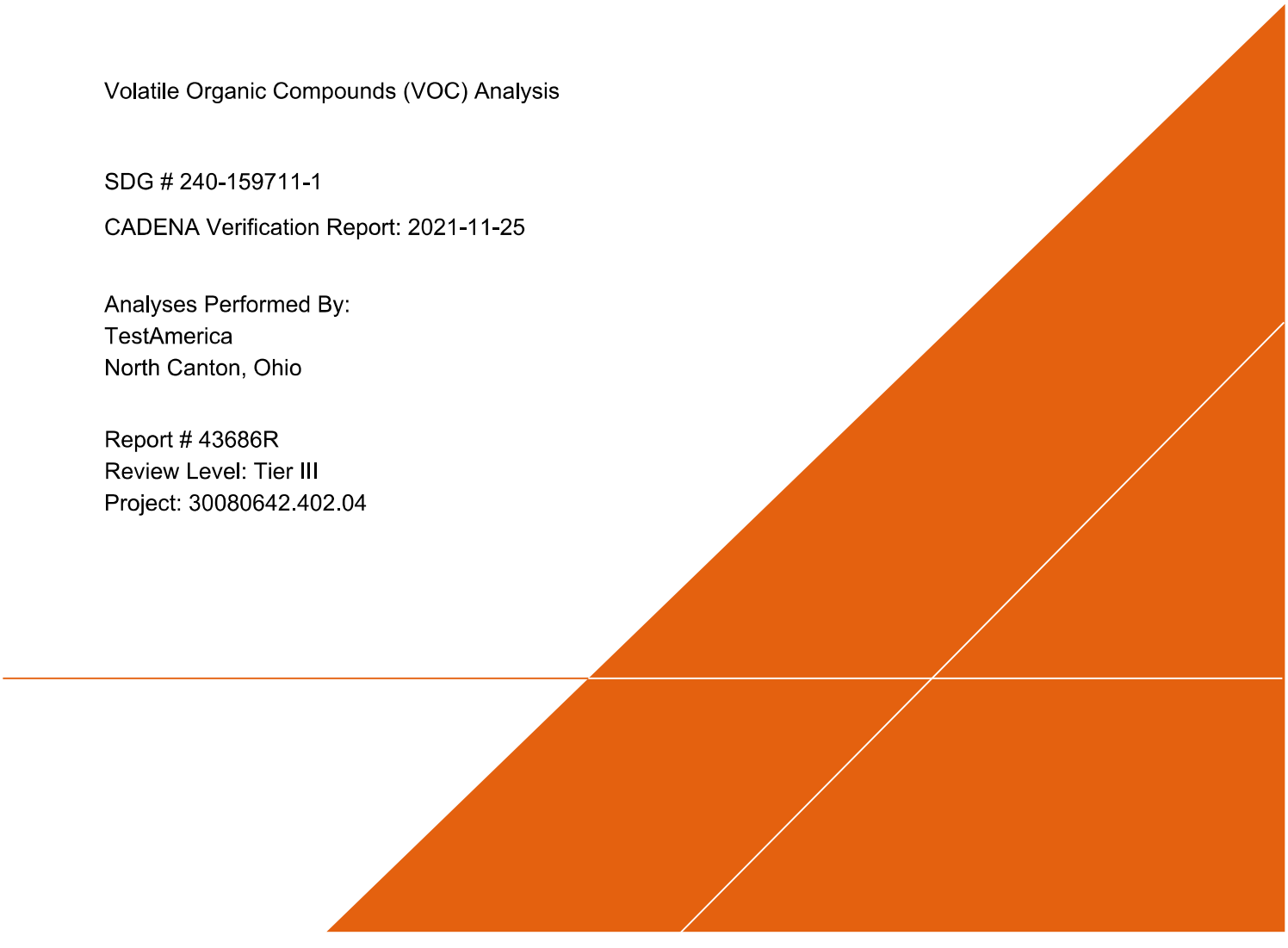
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159711-1

CADENA Verification Report: 2021-11-25

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43686R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159711-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_94	240-159711-1	Water	11/08/21		X	
MW-126S_110821	240-159711-2	Water	11/08/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 10, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 14, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_94	---	---		X						1					N	G	X	X	X	X	X	X	X (CW)	1 Trip Blank
MW-1265_110821	11/08/21	10:56		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159711 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com, Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	11/08/21 1625	Novi Cold Storage	Arcadis	11/8/21 1625
[illegible]	ARCADIS	11/9/21 1040	Teri Hall	ETA	11/9/21 1040
Teri Hall	ETA	11/9/21 1055	Mandy Block	ETA	11-16-21 8:00

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11/24/2021

Client Sample ID: TRIP BLANK_94 — Lab Sample ID: 240-159711-1

Date Collected: 11/08/21 00:00 — **Matrix: Water**
Date Received: 11/10/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 14:05	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 14:05	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 14:05	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 14:05	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 14:05	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 14:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*120*		*62 - 137*		*11/19/21 14:05*	*1*
4-Bromofluorobenzene (Surr)	*71*		*56 - 136*		*11/19/21 14:05*	*1*
Toluene-d8 (Surr)	*86*		*78 - 122*		*11/19/21 14:05*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*11/19/21 14:05*	*1*

Client Sample ID: MW-126S_110821 — Lab Sample ID: 240-159711-2

Date Collected: 11/08/21 10:56 — **Matrix: Water**
Date Received: 11/10/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 01:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*76*		*66 - 120*		*11/18/21 01:08*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 14:27	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 14:27	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 14:27	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 14:27	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 14:27	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 14:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*120*		*62 - 137*		*11/19/21 14:27*	*1*
4-Bromofluorobenzene (Surr)	*66*		*56 - 136*		*11/19/21 14:27*	*1*
Toluene-d8 (Surr)	*88*		*78 - 122*		*11/19/21 14:27*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/19/21 14:27*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159531-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/22/2021 9:26:29 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159531-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159531-1

Job ID: 240-159531-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159531-1

Comments
No additional comments.

Receipt
The samples were received on 11/6/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.0º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159531-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159531-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159531-1	TRIP BLANK_26	Water	11/03/21 00:00	11/06/21 08:00
240-159531-2	MW-109S_110321	Water	11/03/21 12:35	11/06/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159531-1

Client Sample ID: TRIP BLANK_26 — Lab Sample ID: 240-159531-1

No Detections.

Client Sample ID: MW-109S_110321 — Lab Sample ID: 240-159531-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159531-1

Client Sample ID: TRIP BLANK_26
Date Collected: 11/03/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159531-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 01:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 01:19	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 01:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 01:19	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 01:19	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 01:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*62 - 137*		*11/12/21 01:19*	*1*
4-Bromofluorobenzene (Surr)	*74*		*56 - 136*		*11/12/21 01:19*	*1*
Toluene-d8 (Surr)	*110*		*78 - 122*		*11/12/21 01:19*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/12/21 01:19*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159531-1

Client Sample ID: MW-109S_110321
Date Collected: 11/03/21 12:35
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159531-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 19:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*11/12/21 19:17*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 01:42	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 01:42	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 01:42	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 01:42	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 01:42	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 01:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/12/21 01:42*	*1*
4-Bromofluorobenzene (Surr)	*74*		*56 - 136*		*11/12/21 01:42*	*1*
Toluene-d8 (Surr)	*105*		*78 - 122*		*11/12/21 01:42*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*11/12/21 01:42*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159531-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159531-1	TRIP BLANK_26	95	74	110	94
240-159531-2	MW-109S_110321	92	74	105	92
240-159539-B-5 MS	Matrix Spike	96	94	116	97
240-159539-B-5 MSD	Matrix Spike Duplicate	90	87	108	92
LCS 240-512565/4	Lab Control Sample	89	87	107	90
MB 240-512565/6	Method Blank	92	73	102	90

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159531-2	MW-109S_110321	83
240-159543-G-3 MS	Matrix Spike	85
240-159543-O-3 MSD	Matrix Spike Duplicate	83
LCS 240-512758/4	Lab Control Sample	83
MB 240-512758/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512565/6
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 23:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 23:50	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 23:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 23:50	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 23:50	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 23:50	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/11/21 23:50*	*1*
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*11/11/21 23:50*	*1*
Toluene-d8 (Surr)	*102*		*78 - 122*		*11/11/21 23:50*	*1*
Dibromofluoromethane (Surr)	*90*		*73 - 120*		*11/11/21 23:50*	*1*

Lab Sample ID: LCS 240-512565/4
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.4		ug/L		104	63 - 134
cis-1,2-Dichloroethene	10.0	10.1		ug/L		101	77 - 123
Tetrachloroethene	10.0	10.6		ug/L		106	76 - 123
trans-1,2-Dichloroethene	10.0	10.1		ug/L		101	75 - 124
Trichloroethene	10.0	8.95		ug/L		90	70 - 122
Vinyl chloride	10.0	9.56		ug/L		96	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*107*		*78 - 122*
Dibromofluoromethane (Surr)	*90*		*73 - 120*

Lab Sample ID: 240-159539-B-5 MS
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25	U	250	224		ug/L		90	56 - 135
cis-1,2-Dichloroethene	43		250	285		ug/L		97	66 - 128
Tetrachloroethene	25	U	250	201		ug/L		80	62 - 131
trans-1,2-Dichloroethene	86		250	316		ug/L		92	56 - 136
Trichloroethene	830	F1	250	936	F1	ug/L		41	61 - 124
Vinyl chloride	25	U	250	246		ug/L		99	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*
Toluene-d8 (Surr)	*116*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159539-B-5 MS
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	97		73 - 120

Lab Sample ID: 240-159539-B-5 MSD
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	25	U	250	213		ug/L		85	56 - 135	5	26
cis-1,2-Dichloroethene	43		250	272		ug/L		92	66 - 128	5	14
Tetrachloroethene	25	U	250	210		ug/L		84	62 - 131	4	20
trans-1,2-Dichloroethene	86		250	297		ug/L		84	56 - 136	6	15
Trichloroethene	830	F1	250	885	F1	ug/L		21	61 - 124	6	15
Vinyl chloride	25	U	250	233		ug/L		93	43 - 157	6	24

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	90		62 - 137
4-Bromofluorobenzene (Surr)	87		56 - 136
Toluene-d8 (Surr)	108		78 - 122
Dibromofluoromethane (Surr)	92		73 - 120

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512758/5
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 16:51	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	84		66 - 120		11/12/21 16:51	1

Lab Sample ID: LCS 240-512758/4
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.63		ug/L		96	80 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	83		66 - 120

Lab Sample ID: 240-159543-G-3 MS
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	9.98		ug/L		100	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

Lab Sample ID: 240-159543-O-3 MSD
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.71		ug/L		97	51 - 153	3	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159531-1

GC/MS VOA

Analysis Batch: 512565

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159531-1	TRIP BLANK_26	Total/NA	Water	8260B	
240-159531-2	MW-109S_110321	Total/NA	Water	8260B	
MB 240-512565/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512565/4	Lab Control Sample	Total/NA	Water	8260B	
240-159539-B-5 MS	Matrix Spike	Total/NA	Water	8260B	
240-159539-B-5 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 512758

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159531-2	MW-109S_110321	Total/NA	Water	8260B SIM	
MB 240-512758/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512758/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159543-G-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159543-O-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159531-1

Client Sample ID: TRIP BLANK_26

Lab Sample ID: 240-159531-1

Date Collected: 11/03/21 00:00

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512565	11/12/21 01:19	LEE	TAL CAN

Client Sample ID: MW-109S_110321

Lab Sample ID: 240-159531-2

Date Collected: 11/03/21 12:35

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512565	11/12/21 01:42	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512758	11/12/21 19:17	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159531-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN
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Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Seth Turner	TAT if different from below		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:	10 day ✓ 2 weeks / 3 weeks / 1 week / 2 days / 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_26	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-109S_110321	11/3/21	1235		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159531 Chain of Custody

Possible Hazard Identification
✓ Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Return to Client ✓ Disposal By Lab Archive For Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	11/4/21 1500	Novi Cold Storage	Arcadis	11/4/21 1500
Relinquished by: [signature]	Company: ARCADIS	Date/Time: 11/5/21 1435	Received by: [signature]	Company: EA	Date/Time: 11/5/21 1435
Relinquished by: [signature]	Company: EA	Date/Time: 11/5/21 1448	Received in Laboratory by: M.A.A.	Company: EA	Date/Time: 11/6/21 8:00

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11/22/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 159531

Client ARCADIS Site Name

Cooler unpacked by: Matthew Surma

Cooler Received on 11/6/21 Opened on 11/6/21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.9 °C Corrected Cooler Temp. 1.0 °C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes) No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes) No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes (No)
-Were tamper/custody seals intact and uncompromised?	(Yes) No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes (No)
4. Did custody papers accompany the sample(s)?	(Yes) No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes) No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?	
10. Were correct bottle(s) used for the test(s) indicated?	(Yes) No
11. Sufficient quantity received to perform indicated analyses?	(Yes) No
12. Are these work share samples and all listed on the COC?	Yes (No)
If yes, Questions 13-17 have been checked at the originating laboratory.	
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No (NA) pH Strip Lot# HC157842
14. Were VOAs on the COC?	(Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 0104 2016	(Yes) No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes (No)

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by: [signature]

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.

Sample(s) ____ were received in a broken container.

Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.

Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

WI-NC-099

DATA VERIFICATION REPORT

November 22, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159531-1
Sample date: 2021-11-03
Report received by CADENA: 2021-11-22
Initial Data Verification completed by CADENA: 2021-11-22
Number of Samples:2
Sample Matrices: Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

MS/MSD recovery outliers or sample duplicate RPD outliers were not determined using a client sample from this submittal for the test and QC batch noted so qualification was not required based on these sample-specific QC outliers:
GCMS VOC QC batch 512565.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159531-1

		Sample Name:	TRIP BLANK_26				MW-109S_110321			
		Lab Sample ID:	2401595311				2401595312			
		Sample Date:	11/3/2021				11/3/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

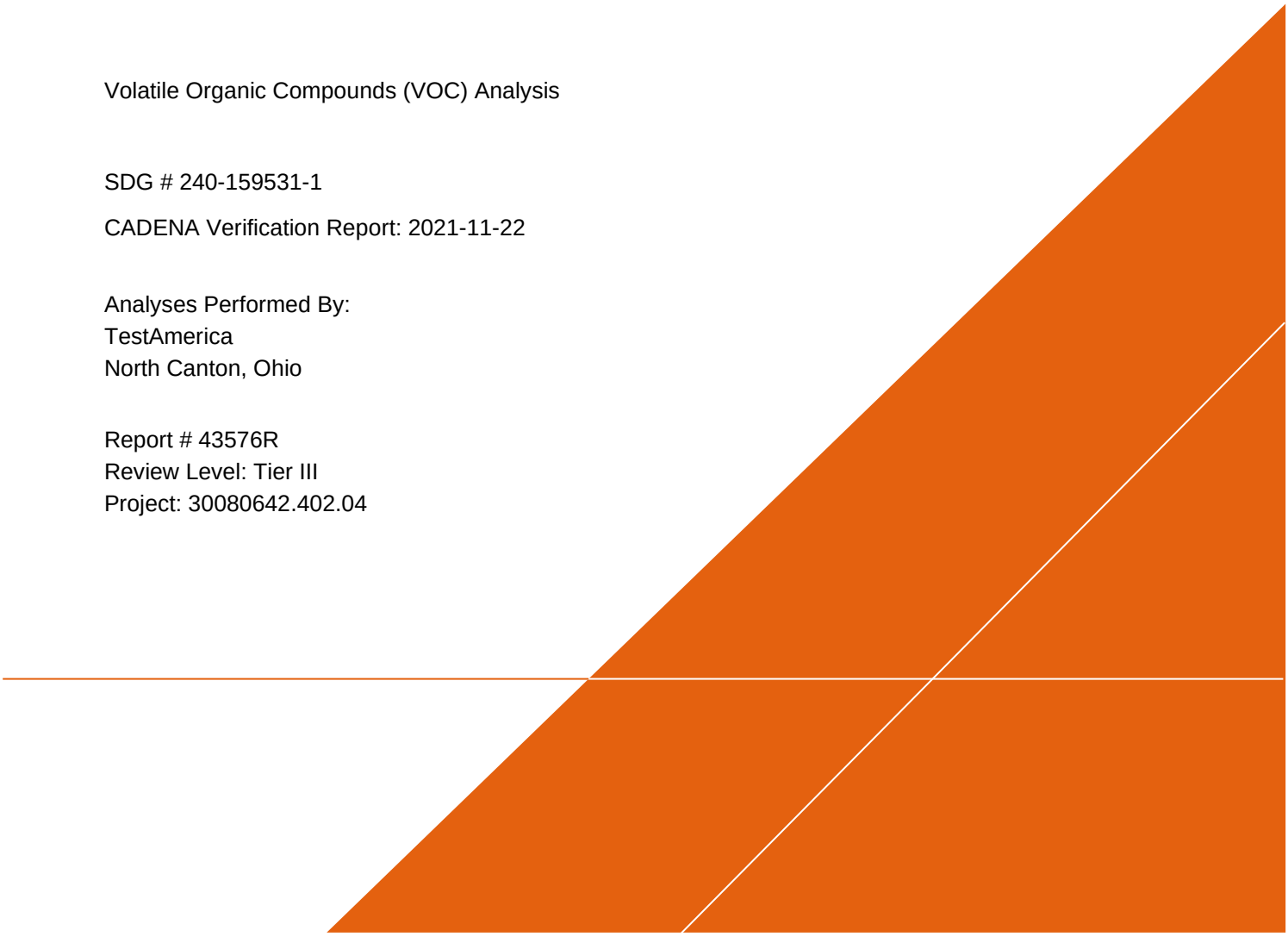
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159531-1

CADENA Verification Report: 2021-11-22

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43576R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159531-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_26	240-159531-1	Water	11/03/21		X	
MW-109S_110321	240-159531-2	Water	11/03/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

DATA REVIEW

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE:

DATE: December 07, 2021

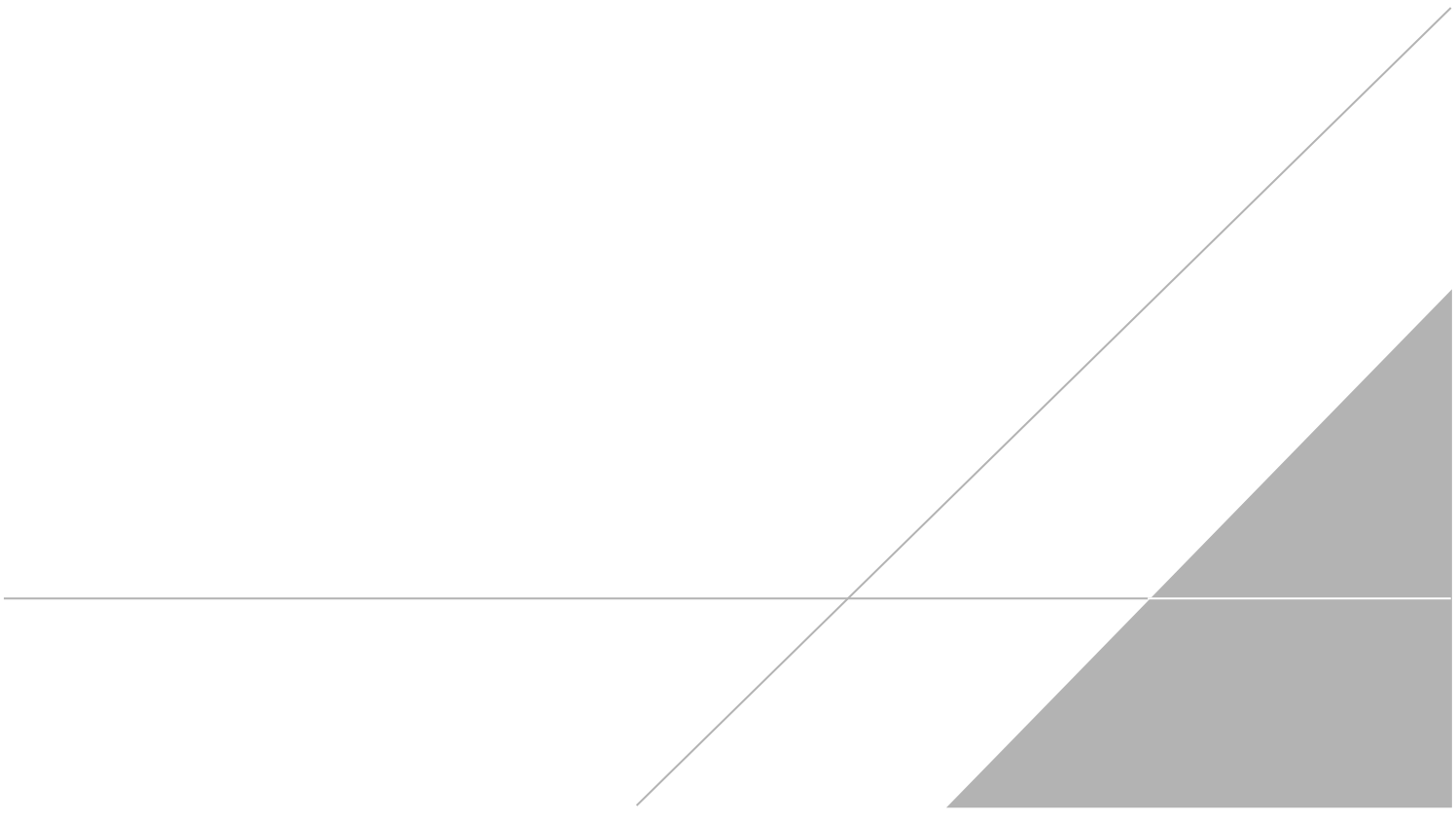
PEER REVIEW: Andrew Korycinski

DATE: December 8, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



MICHIGAN
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Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Seth Turner	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_26	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-109S_110321	11/3/21	1235		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159531 Chain of Custody

Possible Hazard Identification
Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Return to Client Disposal By Lab Archive For Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	11/4/21 1500	Novi Cold Storage	Arcadis	11/4/21 1500
Relinquished by: [signature]	Company: ARCADIS	Date/Time: 11/5/21 1435	Received by: [signature]	Company: EA	Date/Time: 11/5/21 1435
Relinquished by: [signature]	Company: EA	Date/Time: 11/5/21 1448	Received in Laboratory by: M.A.A.	Company: EA	Date/Time: 11/6/21 8:00

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11/22/2021

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159531-1

Client Sample ID: TRIP BLANK_26
Date Collected: 11/03/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159531-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 01:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 01:19	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 01:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 01:19	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 01:19	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 01:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*62 - 137*		*11/12/21 01:19*	*1*
4-Bromofluorobenzene (Surr)	*74*		*56 - 136*		*11/12/21 01:19*	*1*
Toluene-d8 (Surr)	*110*		*78 - 122*		*11/12/21 01:19*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/12/21 01:19*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159531-1

Client Sample ID: MW-109S_110321
Date Collected: 11/03/21 12:35
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159531-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 19:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*11/12/21 19:17*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 01:42	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 01:42	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 01:42	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 01:42	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 01:42	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 01:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/12/21 01:42*	*1*
4-Bromofluorobenzene (Surr)	*74*		*56 - 136*		*11/12/21 01:42*	*1*
Toluene-d8 (Surr)	*105*		*78 - 122*		*11/12/21 01:42*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*11/12/21 01:42*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159825-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/26/2021 7:48:13 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159825-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159825-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159825-1

Comments
No additional comments.

Receipt
The samples were received on 11/11/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 4.6° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159825-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159825-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159825-1	TRIP BLANK_102	Water	11/09/21 00:00	11/11/21 08:00
240-159825-2	MW-181S_110921	Water	11/09/21 11:16	11/11/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159825-1

Client Sample ID: TRIP BLANK_102 — Lab Sample ID: 240-159825-1

No Detections.

Client Sample ID: MW-181S_110921 — Lab Sample ID: 240-159825-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159825-1

Client Sample ID: TRIP BLANK_102
Date Collected: 11/09/21 00:00
Date Received: 11/11/21 08:00

Lab Sample ID: 240-159825-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 05:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 05:19	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 05:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 05:19	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 05:19	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 05:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*115*		*62 - 137*		*11/19/21 05:19*	*1*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*		*11/19/21 05:19*	*1*
Toluene-d8 (Surr)	*101*		*78 - 122*		*11/19/21 05:19*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/19/21 05:19*	*1*

Client Sample ID: MW-181S_110921
Date Collected: 11/09/21 11:16
Date Received: 11/11/21 08:00

Lab Sample ID: 240-159825-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 21:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*		*11/12/21 21:26*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 05:41	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 05:41	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 05:41	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 05:41	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 05:41	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 05:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*111*		*62 - 137*		*11/19/21 05:41*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/19/21 05:41*	*1*
Toluene-d8 (Surr)	*102*		*78 - 122*		*11/19/21 05:41*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/19/21 05:41*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159825-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
Lab Sample ID	Client Sample ID	DCA (62-137)	BFB (56-136)	TOL (78-122)	DBFM (73-120)
240-159825-1	TRIP BLANK_102	115	87	101	102
240-159825-2	MW-181S_110921	111	82	102	100
240-159830-D-2 MS	Matrix Spike	110	86	101	96
240-159830-E-2 MSD	Matrix Spike Duplicate	107	84	97	94
LCS 240-513667/4	Lab Control Sample	101	85	107	94
MB 240-513667/6	Method Blank	110	81	108	98

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	DCA (66-120)
240-159541-G-2 MS	Matrix Spike	77
240-159541-M-2 MSD	Matrix Spike Duplicate	78
240-159825-2	MW-181S_110921	78
LCS 240-512785/4	Lab Control Sample	79
MB 240-512785/5	Method Blank	79

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513667/6
Matrix: Water
Analysis Batch: 513667

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 23:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 23:24	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 23:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 23:24	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 23:24	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 23:24	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*62 - 137*		*11/18/21 23:24*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/18/21 23:24*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/18/21 23:24*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/18/21 23:24*	*1*

Lab Sample ID: LCS 240-513667/4
Matrix: Water
Analysis Batch: 513667

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.6		ug/L		106	63 - 134
cis-1,2-Dichloroethene	10.0	10.7		ug/L		107	77 - 123
Tetrachloroethene	10.0	12.0		ug/L		120	76 - 123
trans-1,2-Dichloroethene	10.0	10.6		ug/L		106	75 - 124
Trichloroethene	10.0	9.72		ug/L		97	70 - 122
Vinyl chloride	10.0	7.48		ug/L		75	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*101*		*62 - 137*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*
Toluene-d8 (Surr)	*107*		*78 - 122*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: 240-159830-D-2 MS
Matrix: Water
Analysis Batch: 513667

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	8.06		ug/L		81	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.32		ug/L		93	66 - 128
Tetrachloroethene	1.0	U	10.0	9.01		ug/L		90	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.50		ug/L		95	56 - 136
Trichloroethene	1.0	U	10.0	8.17		ug/L		82	61 - 124
Vinyl chloride	1.0	U	10.0	7.02		ug/L		70	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*110*		*62 - 137*
4-Bromofluorobenzene (Surr)	*86*		*56 - 136*
Toluene-d8 (Surr)	*101*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159830-D-2 MS
Matrix: Water
Analysis Batch: 513667

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*96*		*73 - 120*

Lab Sample ID: 240-159830-E-2 MSD
Matrix: Water
Analysis Batch: 513667

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	7.67		ug/L		77	56 - 135	5	26
cis-1,2-Dichloroethene	1.0	U	10.0	8.48		ug/L		85	66 - 128	9	14
Tetrachloroethene	1.0	U	10.0	8.29		ug/L		83	62 - 131	8	20
trans-1,2-Dichloroethene	1.0	U	10.0	8.31		ug/L		83	56 - 136	13	15
Trichloroethene	1.0	U	10.0	7.56		ug/L		76	61 - 124	8	15
Vinyl chloride	1.0	U	10.0	6.48		ug/L		65	43 - 157	8	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*107*		*62 - 137*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*
Toluene-d8 (Surr)	*97*		*78 - 122*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512785/5
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 18:32	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*66 - 120*		*11/12/21 18:32*	*1*

Lab Sample ID: LCS 240-512785/4
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.7		ug/L		107	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*66 - 120*

Lab Sample ID: 240-159541-G-2 MS
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

Lab Sample ID: 240-159541-M-2 MSD
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.4		ug/L		104	51 - 153	2	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*

GC/MS VOA

Analysis Batch: 512785

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159825-2	MW-181S_110921	Total/NA	Water	8260B SIM	
MB 240-512785/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512785/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159541-G-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159541-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513667

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159825-1	TRIP BLANK_102	Total/NA	Water	8260B	
240-159825-2	MW-181S_110921	Total/NA	Water	8260B	
MB 240-513667/6	Method Blank	Total/NA	Water	8260B	
LCS 240-513667/4	Lab Control Sample	Total/NA	Water	8260B	
240-159830-D-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159830-E-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159825-1

Client Sample ID: TRIP BLANK_102

Lab Sample ID: 240-159825-1

Date Collected: 11/09/21 00:00

Matrix: Water

Date Received: 11/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513667	11/19/21 05:19	LEE	TAL CAN

Client Sample ID: MW-181S_110921

Lab Sample ID: 240-159825-2

Date Collected: 11/09/21 11:16

Matrix: Water

Date Received: 11/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513667	11/19/21 05:41	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512785	11/12/21 21:26	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159825-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client; Lab sampling
Phone: 248-994-2240	Method of Shipment/Carrier:			Job/SDG No:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_102	---	---		X						1							X	X	X	X	X	X	~~X~~	1 Trip Blank
MW-1815_110921	11/09/21	11:16		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM



Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	11/10/21 8:34	Non-field Storage	Arcadis	11/09/21 8:34
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Arcadis	11/10/21 10:35		GTA	11/10/21 1011
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
	GTA	11/10/21 1011		ETA	11-11-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159825**
Canton Facility

Client Arcadis Site Name

Cooler Received on 11-11-21 Opened on 11-11-21

Cooler unpacked by: Tanya Depp

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # 1A Foam Box Client Cooler Box Other

Packing material used: ~~Bubble Wrap~~ Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 4.5 °C Corrected Cooler Temp. 4.6 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# **HC157842**
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 60358 (Yes) No
17. Was a LL Hg or Me Hg trip blank present? Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

F No SIM on TB per corrected COC. 11/11/21

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

November 26, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159825-1
Sample date: 2021-11-09
Report received by CADENA: 2021-11-26
Initial Data Verification completed by CADENA: 2021-11-26
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159825-1

		Sample Name:	TRIP BLANK_102				MW-181S_110921			
		Lab Sample ID:	2401598251				2401598252			
		Sample Date:	11/9/2021				11/9/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

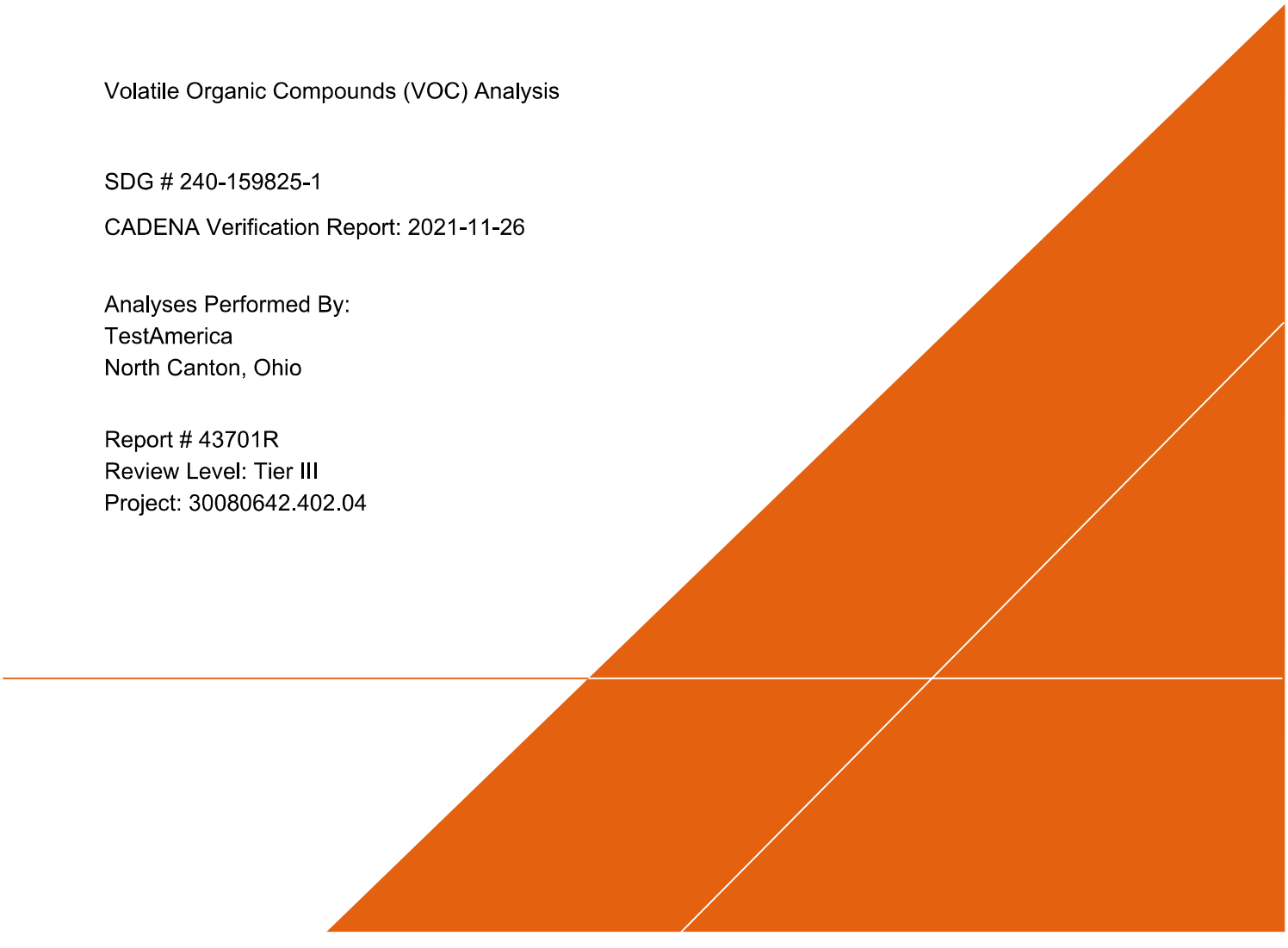
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159825-1

CADENA Verification Report: 2021-11-26

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43701R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159825-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_102	240-159825-1	Water	11/09/21		X	
MW-181S_110921	240-159825-2	Water	11/09/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 14, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 14, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No: 1 of 1 COCs
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day	For lab use only: Walk-in client; Lab sampling; Job/SDG No:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30080642.402.04	Shipping/Tracking No:		
PO # 30080642.402.04			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM				Sample Specific Notes / Special Instructions:
TRIP BLANK_102	---	---		X						1							X	X	X	X	X	X	~~X~~ pm				1 Trip Blank
MW-1815_110921	11/09/21	11:16		X						6					N	G	X	X	X	X	X	X	X				3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159825 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com, Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	11/10/21 8:34	Mbr. Cold Storage	Arcadis	11/09/21 8:34
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Arcadis	11/10/21 10:35		GTA	11/10/21 1031
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
	GTA	11/10/21 1044	Tammy Praga	ETA	11-11-21 800

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11/26/2021

Client Sample ID: TRIP BLANK_102
Lab Sample ID: 240-159825-1
Date Collected: 11/09/21 00:00
Matrix: Water
Date Received: 11/11/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 05:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 05:19	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 05:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 05:19	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 05:19	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 05:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*115*		*62 - 137*		*11/19/21 05:19*	*1*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*		*11/19/21 05:19*	*1*
Toluene-d8 (Surr)	*101*		*78 - 122*		*11/19/21 05:19*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/19/21 05:19*	*1*

Client Sample ID: MW-181S_110921
Lab Sample ID: 240-159825-2
Date Collected: 11/09/21 11:16
Matrix: Water
Date Received: 11/11/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 21:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*		*11/12/21 21:26*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 05:41	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 05:41	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 05:41	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 05:41	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 05:41	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 05:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*111*		*62 - 137*		*11/19/21 05:41*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/19/21 05:41*	*1*
Toluene-d8 (Surr)	*102*		*78 - 122*		*11/19/21 05:41*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/19/21 05:41*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159530-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/22/2021 9:25:55 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159530-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159530-1

Job ID: 240-159530-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159530-1

Comments
No additional comments.

Receipt
The samples were received on 11/6/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.0º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159530-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159530-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159530-1	TRIP BLANK_28	Water	11/03/21 00:00	11/06/21 08:00
240-159530-2	MW-170S_110321	Water	11/03/21 11:10	11/06/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159530-1

Client Sample ID: TRIP BLANK_28 — Lab Sample ID: 240-159530-1

No Detections.

Client Sample ID: MW-170S_110321 — Lab Sample ID: 240-159530-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159530-1

Client Sample ID: TRIP BLANK_28
Date Collected: 11/03/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159530-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 00:35	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 00:35	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 00:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 00:35	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 00:35	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 00:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*62 - 137*		*11/12/21 00:35*	*1*
4-Bromofluorobenzene (Surr)	*79*		*56 - 136*		*11/12/21 00:35*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/12/21 00:35*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*11/12/21 00:35*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159530-1

Client Sample ID: MW-170S_110321
Date Collected: 11/03/21 11:10
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159530-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 17:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*11/12/21 17:41*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 00:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 00:57	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 00:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 00:57	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 00:57	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 00:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*62 - 137*		*11/12/21 00:57*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/12/21 00:57*	*1*
Toluene-d8 (Surr)	*111*		*78 - 122*		*11/12/21 00:57*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*11/12/21 00:57*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159530-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159530-1	TRIP BLANK_28	94	79	108	92
240-159530-2	MW-170S_110321	97	82	111	95
240-159539-B-5 MS	Matrix Spike	96	94	116	97
240-159539-B-5 MSD	Matrix Spike Duplicate	90	87	108	92
LCS 240-512565/4	Lab Control Sample	89	87	107	90
MB 240-512565/6	Method Blank	92	73	102	90

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159530-2	MW-170S_110321	83
240-159543-G-3 MS	Matrix Spike	85
240-159543-O-3 MSD	Matrix Spike Duplicate	83
LCS 240-512758/4	Lab Control Sample	83
MB 240-512758/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512565/6
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 23:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 23:50	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 23:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 23:50	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 23:50	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 23:50	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/11/21 23:50*	*1*
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*11/11/21 23:50*	*1*
Toluene-d8 (Surr)	*102*		*78 - 122*		*11/11/21 23:50*	*1*
Dibromofluoromethane (Surr)	*90*		*73 - 120*		*11/11/21 23:50*	*1*

Lab Sample ID: LCS 240-512565/4
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.4		ug/L		104	63 - 134
cis-1,2-Dichloroethene	10.0	10.1		ug/L		101	77 - 123
Tetrachloroethene	10.0	10.6		ug/L		106	76 - 123
trans-1,2-Dichloroethene	10.0	10.1		ug/L		101	75 - 124
Trichloroethene	10.0	8.95		ug/L		90	70 - 122
Vinyl chloride	10.0	9.56		ug/L		96	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*107*		*78 - 122*
Dibromofluoromethane (Surr)	*90*		*73 - 120*

Lab Sample ID: 240-159539-B-5 MS
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25	U	250	224		ug/L		90	56 - 135
cis-1,2-Dichloroethene	43		250	285		ug/L		97	66 - 128
Tetrachloroethene	25	U	250	201		ug/L		80	62 - 131
trans-1,2-Dichloroethene	86		250	316		ug/L		92	56 - 136
Trichloroethene	830	F1	250	936	F1	ug/L		41	61 - 124
Vinyl chloride	25	U	250	246		ug/L		99	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*
Toluene-d8 (Surr)	*116*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159539-B-5 MS
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*97*		*73 - 120*

Lab Sample ID: 240-159539-B-5 MSD
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	25	U	250	213		ug/L		85	56 - 135	5	26
cis-1,2-Dichloroethene	43		250	272		ug/L		92	66 - 128	5	14
Tetrachloroethene	25	U	250	210		ug/L		84	62 - 131	4	20
trans-1,2-Dichloroethene	86		250	297		ug/L		84	56 - 136	6	15
Trichloroethene	830	F1	250	885	F1	ug/L		21	61 - 124	6	15
Vinyl chloride	25	U	250	233		ug/L		93	43 - 157	6	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*108*		*78 - 122*
Dibromofluoromethane (Surr)	*92*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512758/5
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 16:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/12/21 16:51*	*1*

Lab Sample ID: LCS 240-512758/4
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.63		ug/L		96	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

Lab Sample ID: 240-159543-G-3 MS
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	9.98		ug/L		100	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

Lab Sample ID: 240-159543-O-3 MSD
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.71		ug/L		97	51 - 153	3	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159530-1

GC/MS VOA

Analysis Batch: 512565

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159530-1	TRIP BLANK_28	Total/NA	Water	8260B	
240-159530-2	MW-170S_110321	Total/NA	Water	8260B	
MB 240-512565/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512565/4	Lab Control Sample	Total/NA	Water	8260B	
240-159539-B-5 MS	Matrix Spike	Total/NA	Water	8260B	
240-159539-B-5 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 512758

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159530-2	MW-170S_110321	Total/NA	Water	8260B SIM	
MB 240-512758/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512758/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159543-G-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159543-O-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159530-1

Client Sample ID: TRIP BLANK_28

Lab Sample ID: 240-159530-1

Date Collected: 11/03/21 00:00

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512565	11/12/21 00:35	LEE	TAL CAN

Client Sample ID: MW-170S_110321

Lab Sample ID: 240-159530-2

Date Collected: 11/03/21 11:10

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512565	11/12/21 00:57	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512758	11/12/21 17:41	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159530-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	For lab use only
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	Walk-in client
Phone: 248-994-2240	Sampler Name: Seth Turner	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30080642.402.04	Shipping/Tracking No:			
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM				Sample Specific Notes / Special Instructions:
TRIP BLANK_28	—	—		X						1					N	G	X	X	X	X	X	X	X (DW)				1 Trip Blank
MW-170S_110321	11/3/21	1110		X						6					N	G	X	X	X	X	X	X	X				3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-ST																											

240-159530 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Seth Turner	Arcadis	11/4/21 / 1500	Novi cold storage	Arcadis	11/4/21 / 1500
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Heather Allen	ARCADIS	11/5/21 / 1435	Teri Hall	ETA	11/5/21 1435
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
Teri Hall	ETA	11/6/21 1448	M. A. S.	ETA	11/6/21 8:00

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 154530
Canton Facility

Client ARCADIS Site Name

Cooler unpacked by: Matthew Surma

Cooler Received on 11/6/21 Opened on 11/6/21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.9 °C Corrected Cooler Temp. 1.0 °C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No (NA)	pH Strip Lot# HC157842
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes (No)	NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #0104201G	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes (No)	

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by: Peter C

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.

Sample(s) ____ were received in a broken container.

Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.

Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

WI-NC-099

DATA VERIFICATION REPORT

November 22, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159530-1
Sample date: 2021-11-03
Report received by CADENA: 2021-11-22
Initial Data Verification completed by CADENA: 2021-11-22
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

MS/MSD recovery outliers or sample duplicate RPD outliers were not determined using a client sample from this submittal for the test and QC batch noted so qualification was not required based on these sample-specific QC outliers:
GCMS VOC QC batch 512565.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159530-1

		Sample Name:	TRIP BLANK_28				MW-170S_110321			
		Lab Sample ID:	2401595301				2401595302			
		Sample Date:	11/3/2021				11/3/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

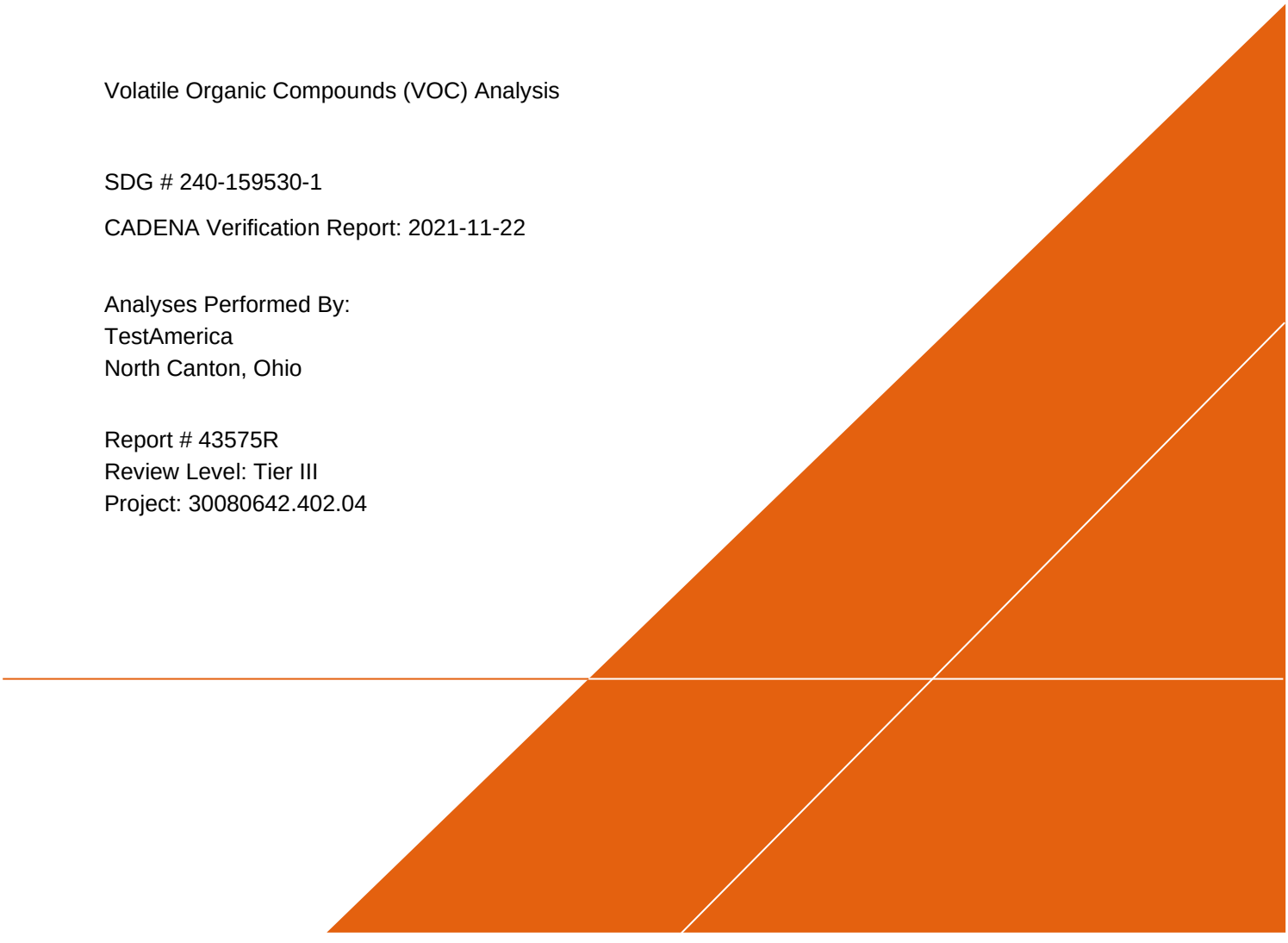
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159530-1

CADENA Verification Report: 2021-11-22

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43575R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159530-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_28	240-159530-1	Water	11/03/21		X	
MW-170S_110321	240-159530-2	Water	11/03/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

DATA REVIEW

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE:

DATE: December 07, 2021

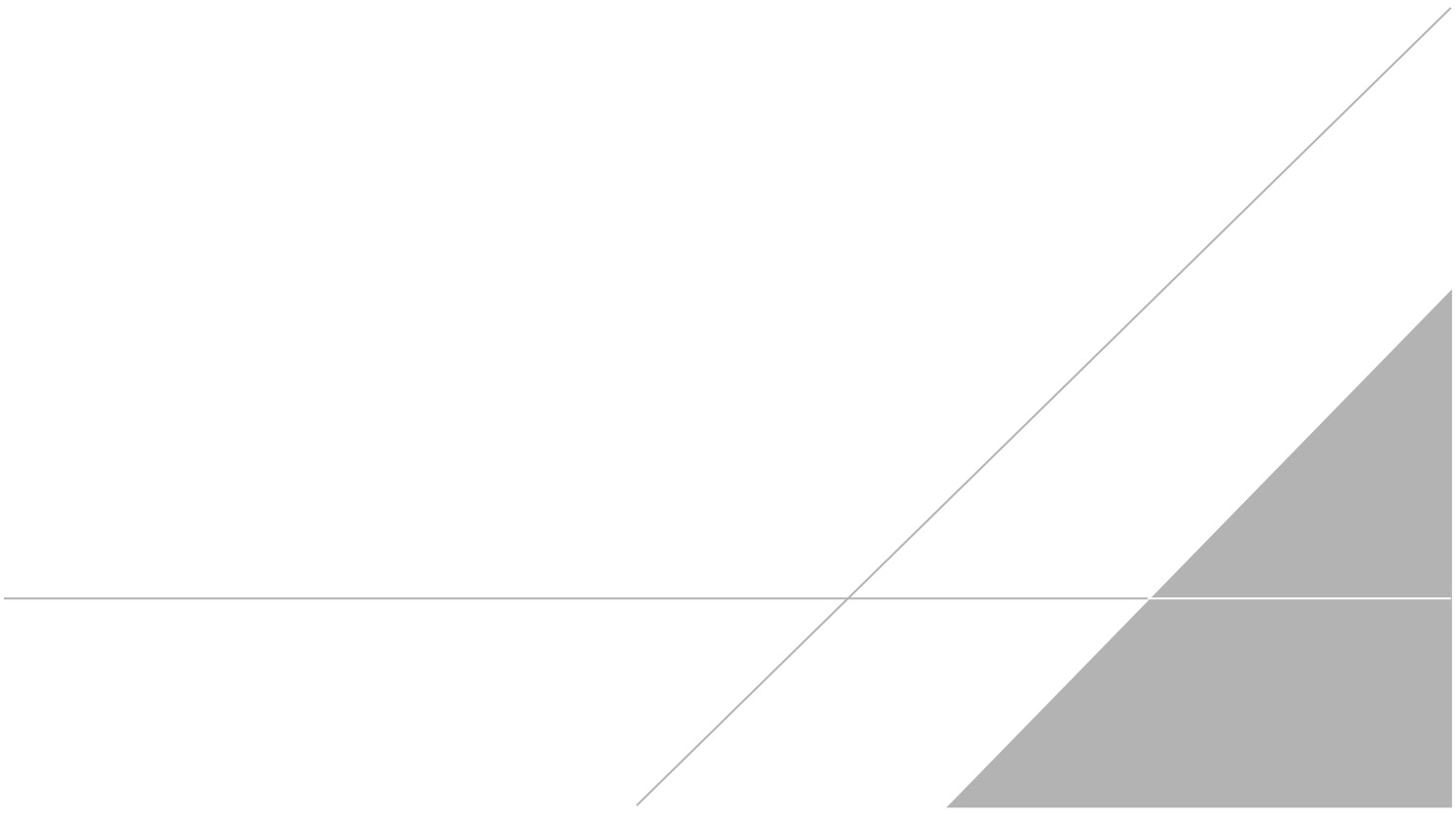
PEER REVIEW: Andrew Korycinski

DATE: December 8, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	For lab use only
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	Walk-in client
Phone: 248-994-2240	Sampler Name: Seth Turner	TAT if different from below: 10 day; 3 weeks, ✓ 2 weeks, 1 week, 2 days, 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30080642.402.04	Shipping/Tracking No:			
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM				Sample Specific Notes / Special Instructions:
TRIP BLANK_28	—	—		X						1					N	G	X	X	X	X	X	X	X (DW)				1 Trip Blank
MW-170S_110321	11/3/21	1110		X						6					N	G	X	X	X	X	X	X	X				3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-ST																											

240-159530 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; ✓ Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Seth Turner	Arcadis	11/4/21 / 1500	NOVI cold storage	Arcadis	11/4/21 / 1500
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Heather Allen	ARCADIS	11/5/21 / 1435	Jeri Hall	ETA	11/5/21 1435
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
Jeri Hall	ETA	11/6/21 1448	M. A. S.	ETA	11/6/21 8:00

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Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159530-1

Client Sample ID: TRIP BLANK_28
Date Collected: 11/03/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159530-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 00:35	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 00:35	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 00:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 00:35	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 00:35	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 00:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*62 - 137*		*11/12/21 00:35*	*1*
4-Bromofluorobenzene (Surr)	*79*		*56 - 136*		*11/12/21 00:35*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/12/21 00:35*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*11/12/21 00:35*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159530-1

Client Sample ID: MW-170S_110321
Date Collected: 11/03/21 11:10
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159530-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 17:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*11/12/21 17:41*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 00:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 00:57	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 00:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 00:57	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 00:57	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 00:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*62 - 137*		*11/12/21 00:57*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/12/21 00:57*	*1*
Toluene-d8 (Surr)	*111*		*78 - 122*		*11/12/21 00:57*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*11/12/21 00:57*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159632-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/23/2021 10:31:35 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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Have a Question? Ask The Expert

Visit us at:
www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159632-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159632-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159632-1

Comments
No additional comments.

Receipt
The samples were received on 11/9/2021 10:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 3.7° C and 3.8° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159632-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159632-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159632-1	TRIP BLANK_41	Water	11/05/21 00:00	11/09/21 10:00
240-159632-2	MW-215S_110521	Water	11/05/21 15:00	11/09/21 10:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159632-1

Client Sample ID: TRIP BLANK_41 — Lab Sample ID: 240-159632-1

No Detections.

Client Sample ID: MW-215S_110521 — Lab Sample ID: 240-159632-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159632-1

Client Sample ID: TRIP BLANK_41

Date Collected: 11/05/21 00:00
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159632-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 21:21	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 21:21	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 21:21	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 21:21	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 21:21	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 21:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/16/21 21:21*	*1*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*		*11/16/21 21:21*	*1*
Toluene-d8 (Surr)	*92*		*78 - 122*		*11/16/21 21:21*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/16/21 21:21*	*1*

Client Sample ID: MW-215S_110521

Date Collected: 11/05/21 15:00
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159632-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 00:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*11/17/21 00:59*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 22:37	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 22:37	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 22:37	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 22:37	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 22:37	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 22:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*11/16/21 22:37*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/16/21 22:37*	*1*
Toluene-d8 (Surr)	*93*		*78 - 122*		*11/16/21 22:37*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/16/21 22:37*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159632-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159556-A-21 MS	Matrix Spike	88	90	93	97
240-159556-A-21 MSD	Matrix Spike Duplicate	86	90	92	94
240-159632-1	TRIP BLANK_41	93	85	92	100
240-159632-2	MW-215S_110521	96	81	93	102
LCS 240-513207/5	Lab Control Sample	86	91	94	94
MB 240-513207/8	Method Blank	94	85	91	102

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159546-G-2 MS	Matrix Spike	82
240-159546-M-2 MSD	Matrix Spike Duplicate	85
240-159632-2	MW-215S_110521	82
LCS 240-513286/4	Lab Control Sample	82
MB 240-513286/5	Method Blank	85

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513207/8
Matrix: Water
Analysis Batch: 513207

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 14:40	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 14:40	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 14:40	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 14:40	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 14:40	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 14:40	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*62 - 137*		*11/16/21 14:40*	*1*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*		*11/16/21 14:40*	*1*
Toluene-d8 (Surr)	*91*		*78 - 122*		*11/16/21 14:40*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/16/21 14:40*	*1*

Lab Sample ID: LCS 240-513207/5
Matrix: Water
Analysis Batch: 513207

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	26.9		ug/L		107	63 - 134
cis-1,2-Dichloroethene	25.0	24.4		ug/L		98	77 - 123
Tetrachloroethene	25.0	27.1		ug/L		108	76 - 123
trans-1,2-Dichloroethene	25.0	25.3		ug/L		101	75 - 124
Trichloroethene	25.0	26.3		ug/L		105	70 - 122
Vinyl chloride	25.0	20.2		ug/L		81	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*
4-Bromofluorobenzene (Surr)	*91*		*56 - 136*
Toluene-d8 (Surr)	*94*		*78 - 122*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: 240-159556-A-21 MS
Matrix: Water
Analysis Batch: 513207

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	100	U	2500	2520		ug/L		101	56 - 135
cis-1,2-Dichloroethene	100	U	2500	2460		ug/L		98	66 - 128
Tetrachloroethene	3100		2500	5610		ug/L		100	62 - 131
trans-1,2-Dichloroethene	100	U	2500	2480		ug/L		99	56 - 136
Trichloroethene	83	J	2500	2530		ug/L		98	61 - 124
Vinyl chloride	100	U	2500	1980		ug/L		79	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*62 - 137*
4-Bromofluorobenzene (Surr)	*90*		*56 - 136*
Toluene-d8 (Surr)	*93*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159556-A-21 MS
Matrix: Water
Analysis Batch: 513207

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*97*		*73 - 120*

Lab Sample ID: 240-159556-A-21 MSD
Matrix: Water
Analysis Batch: 513207

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	100	U	2500	2510		ug/L		100	56 - 135	0	26
cis-1,2-Dichloroethene	100	U	2500	2470		ug/L		99	66 - 128	1	14
Tetrachloroethene	3100		2500	5590		ug/L		99	62 - 131	0	20
trans-1,2-Dichloroethene	100	U	2500	2480		ug/L		99	56 - 136	0	15
Trichloroethene	83	J	2500	2610		ug/L		101	61 - 124	3	15
Vinyl chloride	100	U	2500	1920		ug/L		77	43 - 157	3	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*
4-Bromofluorobenzene (Surr)	*90*		*56 - 136*
Toluene-d8 (Surr)	*92*		*78 - 122*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513286/5
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/16/21 19:44	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/16/21 19:44*	*1*

Lab Sample ID: LCS 240-513286/4
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.78		ug/L		98	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159546-G-2 MS
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	11.0		ug/L		110	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159546-M-2 MSD
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.83		ug/L		98	51 - 153	11	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

GC/MS VOA

Analysis Batch: 513207

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159632-1	TRIP BLANK_41	Total/NA	Water	8260B	
240-159632-2	MW-215S_110521	Total/NA	Water	8260B	
MB 240-513207/8	Method Blank	Total/NA	Water	8260B	
LCS 240-513207/5	Lab Control Sample	Total/NA	Water	8260B	
240-159556-A-21 MS	Matrix Spike	Total/NA	Water	8260B	
240-159556-A-21 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 513286

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159632-2	MW-215S_110521	Total/NA	Water	8260B SIM	
MB 240-513286/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513286/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159546-G-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159546-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159632-1

Client Sample ID: TRIP BLANK_41

Lab Sample ID: 240-159632-1

Date Collected: 11/05/21 00:00
Matrix: Water
Date Received: 11/09/21 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513207	11/16/21 21:21	SAM	TAL CAN

Client Sample ID: MW-215S_110521

Lab Sample ID: 240-159632-2

Date Collected: 11/05/21 15:00
Matrix: Water
Date Received: 11/09/21 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513207	11/16/21 22:37	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	513286	11/17/21 00:59	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159632-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

CHIGAN 190

TestAmerica

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COC's
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Seth Turner	TAT if different from below: ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 41	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-21SS_110521	11/5/21	1500		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159632 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ an Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com Cadena #E203631
Level IV Reporting requested

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Seth Turner	Arcadis	11/5/21 / 1600	Novi cold storage	Arcadis	11/5/21 / 1600
	ARCADIS	11/6/21 / 1200		ETA	11/8/21 / 1200
	ETA	11/8/21		ETA	11-9-21 1000

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 159632
Canton Facility

Client ARCADIS Site Name _____ Cooler unpacked by: Tammy Dorgan

Cooler Received on 11-9-21 Opened on 11-9-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 2 Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
   -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? Yes No
11. Sufficient quantity received to perform indicated analyses? ~~Yes No~~ Yes
12. Are these work share samples and all listed on the COC? Yes No
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# **HC157842**
14. Were VOAs on the COC? Yes No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 60358 Yes No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page Samples processed by:

The TD is not logged for SIM ~~due to insufficient volume~~ per corrected COC. 11/11/21 ~~11/9/21~~

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

WI-NC-099

Login # : 159632

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form				
Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
(TA) Client Box Other	(IR-14) IR-15	3.6	3.7	(Wet Ice) Blue Ice Dry Ice Water None
(TA) Client Box Other	IR-14 IR-15	3.7	3.8	(Wet Ice) Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
☐ See Temperature Excursion Form				

WI-NC-099 Cooler Receipt Form Page 2 – Multiple Coolers

DATA VERIFICATION REPORT

November 23, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159632-1
Sample date: 2021-11-05
Report received by CADENA: 2021-11-23
Initial Data Verification completed by CADENA: 2021-11-23
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159632-1

		Sample Name:	TRIP BLANK_41				MW-215S_110521			
		Lab Sample ID:	2401596321				2401596322			
		Sample Date:	11/5/2021				11/5/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

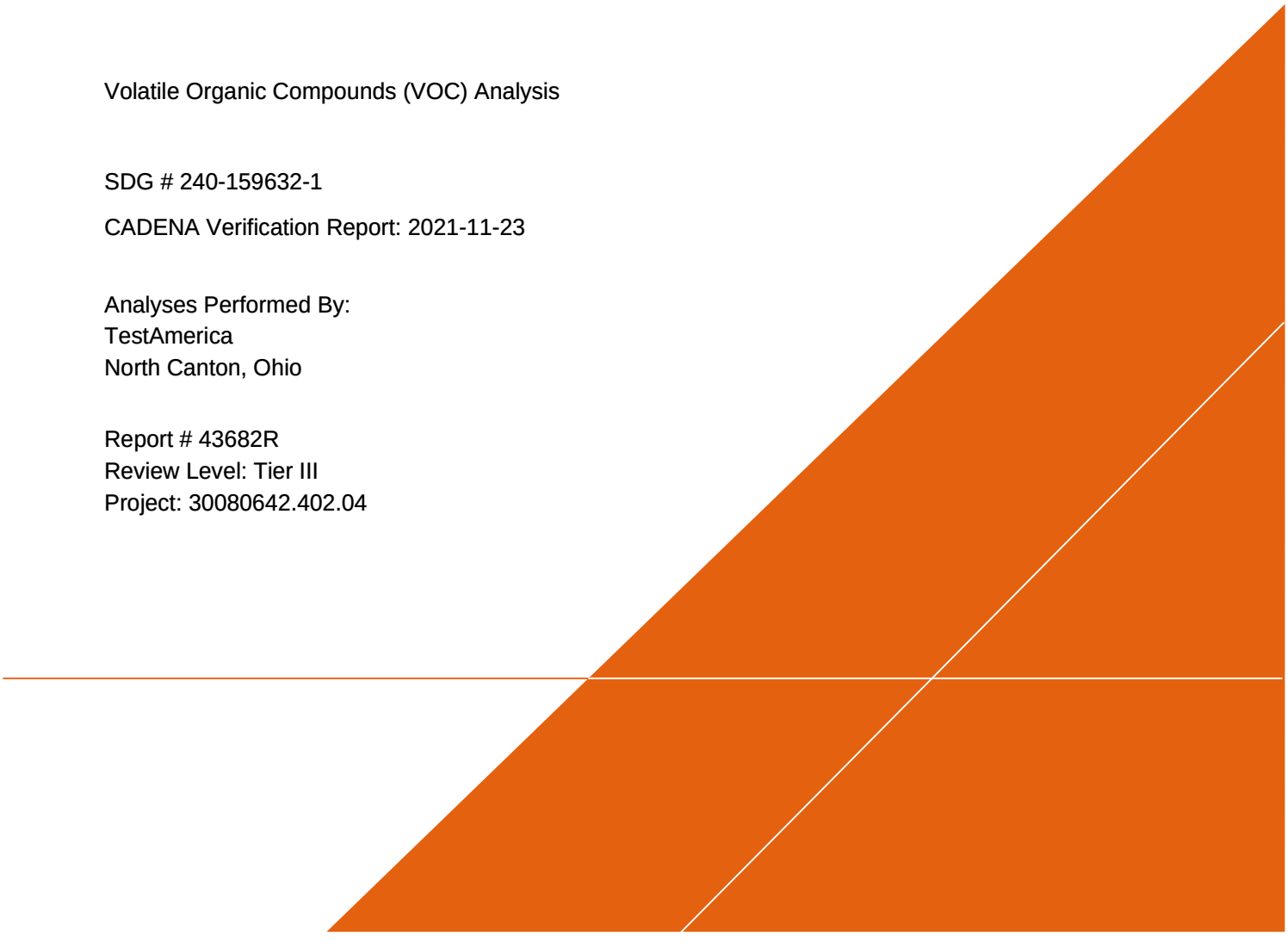
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159632-1

CADENA Verification Report: 2021-11-23

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43682R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159632-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_41	240-159632-1	Water	11/05/21		X	
MW-215S_110521	240-159632-2	Water	11/05/21		X	X

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 10, 2021

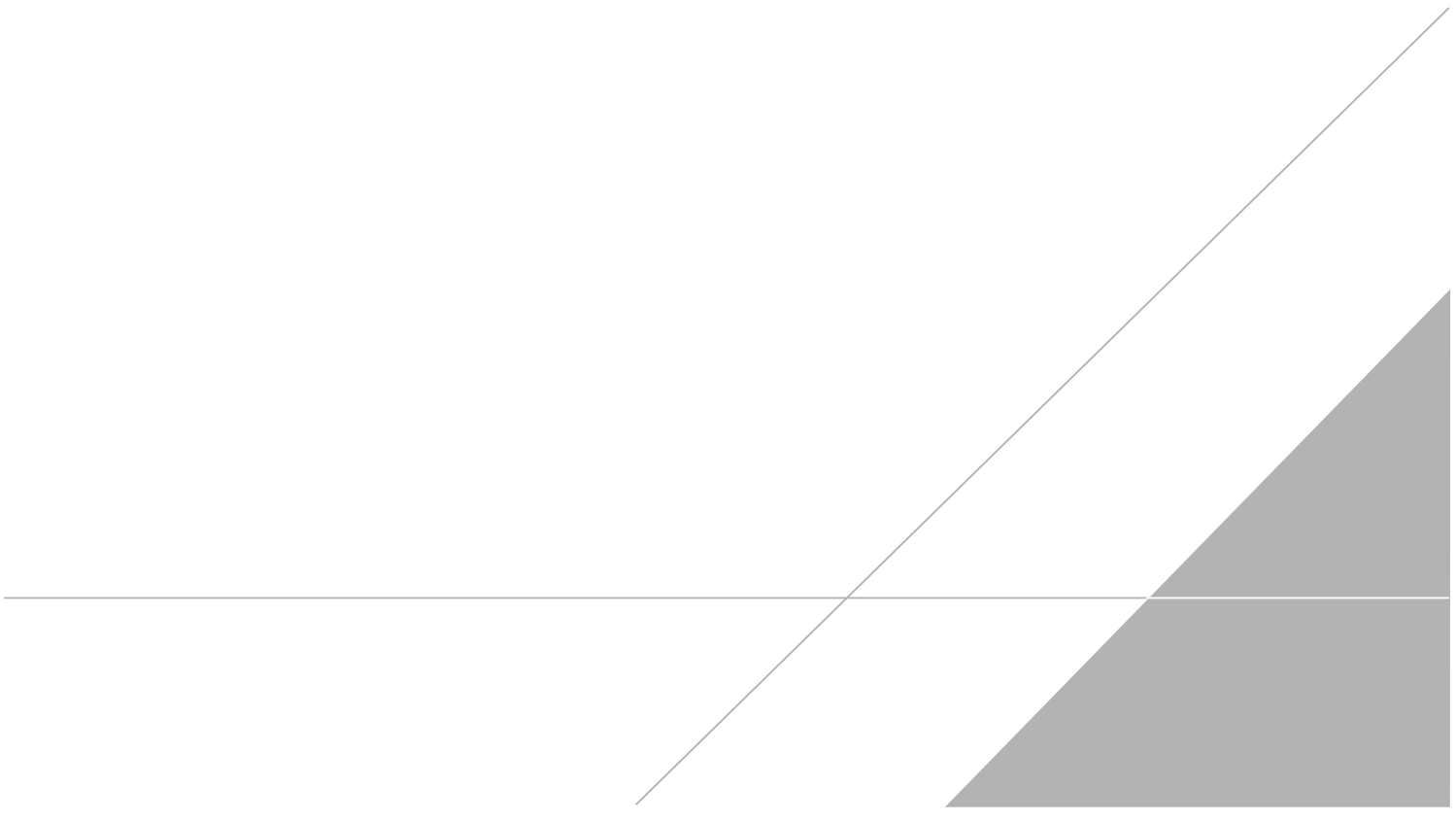
PEER REVIEW: Andrew Korycinski

DATE: December 14, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



Chain of Custody Record

CHIGAN 190

TestAmerica

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Seth Turner	TAT if different from below: ☐ 3 weeks; 10 day ✓ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling:
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM			Sample Specific Notes / Special Instructions:
TRIP BLANK_ 41	---	---		X						1					N	G	X	X	X	X	X	X	X			1 Trip Blank
MW-2155_110521	11/5/21	1500		X						6					N	G	X	X	X	X	X	X	X			3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159632 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ✓ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com Cadena #E203631
Level IV Reporting requested

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Seth Turner	Arcadis	11/5/21 1600	Novi cold storage	Arcadis	11/5/21 1600
	Company:	Date/Time:	Received by:	Company:	Date/Time:
	ARCHOIS	11/8/21 1200		ETA	11/8/21 1200
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
	ETA	11/8/21		ETA	11-9-21 1000

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11/23/2021

Client Sample ID: TRIP BLANK_41
Lab Sample ID: 240-159632-1
Date Collected: 11/05/21 00:00
Matrix: Water
Date Received: 11/09/21 10:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 21:21	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 21:21	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 21:21	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 21:21	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 21:21	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 21:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/16/21 21:21*	
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*		*11/16/21 21:21*	
Toluene-d8 (Surr)	*92*		*78 - 122*		*11/16/21 21:21*	
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/16/21 21:21*	

Client Sample ID: MW-215S_110521
Lab Sample ID: 240-159632-2
Date Collected: 11/05/21 15:00
Matrix: Water
Date Received: 11/09/21 10:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 00:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*11/17/21 00:59*	

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 22:37	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 22:37	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 22:37	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 22:37	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 22:37	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 22:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*11/16/21 22:37*	
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/16/21 22:37*	
Toluene-d8 (Surr)	*93*		*78 - 122*		*11/16/21 22:37*	
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/16/21 22:37*	

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159532-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/22/2021 9:28:46 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

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Visit us at:
www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159532-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159532-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159532-1

Comments
No additional comments.

Receipt
The samples were received on 11/6/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.1° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159532-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159532-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159532-1	TRIP BLANK_10	Water	11/01/21 00:00	11/06/21 08:00
240-159532-2	MW-223S_110121	Water	11/01/21 13:00	11/06/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159532-1

Client Sample ID: TRIP BLANK_10 — Lab Sample ID: 240-159532-1

No Detections.

Client Sample ID: MW-223S_110121 — Lab Sample ID: 240-159532-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Trichloroethene	0.67	J	1.0	0.44	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159532-1

Client Sample ID: TRIP BLANK_10

Date Collected: 11/01/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159532-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 02:04	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 02:04	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 02:04	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 02:04	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 02:04	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 02:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*		*11/12/21 02:04*	*1*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*		*11/12/21 02:04*	*1*
Toluene-d8 (Surr)	*110*		*78 - 122*		*11/12/21 02:04*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/12/21 02:04*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159532-1

Client Sample ID: MW-223S_110121
Date Collected: 11/01/21 13:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159532-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 19:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*11/12/21 19:40*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 02:26	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 02:26	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 02:26	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 02:26	1
Trichloroethene	**0.67**	**J**	1.0	0.44	ug/L			11/12/21 02:26	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 02:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/12/21 02:26*	*1*
4-Bromofluorobenzene (Surr)	*77*		*56 - 136*		*11/12/21 02:26*	*1*
Toluene-d8 (Surr)	*100*		*78 - 122*		*11/12/21 02:26*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/12/21 02:26*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159532-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159532-1	TRIP BLANK_10	100	85	110	100
240-159532-2	MW-223S_110121	93	77	100	94
240-159539-B-5 MS	Matrix Spike	96	94	116	97
240-159539-B-5 MSD	Matrix Spike Duplicate	90	87	108	92
LCS 240-512565/4	Lab Control Sample	89	87	107	90
MB 240-512565/6	Method Blank	92	73	102	90

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159532-2	MW-223S_110121	83
240-159543-G-3 MS	Matrix Spike	85
240-159543-O-3 MSD	Matrix Spike Duplicate	83
LCS 240-512758/4	Lab Control Sample	83
MB 240-512758/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512565/6
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 23:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 23:50	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 23:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 23:50	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 23:50	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 23:50	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/11/21 23:50*	*1*
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*11/11/21 23:50*	*1*
Toluene-d8 (Surr)	*102*		*78 - 122*		*11/11/21 23:50*	*1*
Dibromofluoromethane (Surr)	*90*		*73 - 120*		*11/11/21 23:50*	*1*

Lab Sample ID: LCS 240-512565/4
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.4		ug/L		104	63 - 134
cis-1,2-Dichloroethene	10.0	10.1		ug/L		101	77 - 123
Tetrachloroethene	10.0	10.6		ug/L		106	76 - 123
trans-1,2-Dichloroethene	10.0	10.1		ug/L		101	75 - 124
Trichloroethene	10.0	8.95		ug/L		90	70 - 122
Vinyl chloride	10.0	9.56		ug/L		96	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*107*		*78 - 122*
Dibromofluoromethane (Surr)	*90*		*73 - 120*

Lab Sample ID: 240-159539-B-5 MS
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25	U	250	224		ug/L		90	56 - 135
cis-1,2-Dichloroethene	43		250	285		ug/L		97	66 - 128
Tetrachloroethene	25	U	250	201		ug/L		80	62 - 131
trans-1,2-Dichloroethene	86		250	316		ug/L		92	56 - 136
Trichloroethene	830	F1	250	936	F1	ug/L		41	61 - 124
Vinyl chloride	25	U	250	246		ug/L		99	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*
Toluene-d8 (Surr)	*116*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159539-B-5 MS
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*97*		*73 - 120*

Lab Sample ID: 240-159539-B-5 MSD
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	25	U	250	213		ug/L		85	56 - 135	5	26
cis-1,2-Dichloroethene	43		250	272		ug/L		92	66 - 128	5	14
Tetrachloroethene	25	U	250	210		ug/L		84	62 - 131	4	20
trans-1,2-Dichloroethene	86		250	297		ug/L		84	56 - 136	6	15
Trichloroethene	830	F1	250	885	F1	ug/L		21	61 - 124	6	15
Vinyl chloride	25	U	250	233		ug/L		93	43 - 157	6	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*108*		*78 - 122*
Dibromofluoromethane (Surr)	*92*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512758/5
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 16:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/12/21 16:51*	*1*

Lab Sample ID: LCS 240-512758/4
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.63		ug/L		96	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

Lab Sample ID: 240-159543-G-3 MS
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	9.98		ug/L		100	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

Lab Sample ID: 240-159543-O-3 MSD
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.71		ug/L		97	51 - 153	3	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159532-1

GC/MS VOA

Analysis Batch: 512565

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159532-1	TRIP BLANK_10	Total/NA	Water	8260B	
240-159532-2	MW-223S_110121	Total/NA	Water	8260B	
MB 240-512565/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512565/4	Lab Control Sample	Total/NA	Water	8260B	
240-159539-B-5 MS	Matrix Spike	Total/NA	Water	8260B	
240-159539-B-5 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 512758

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159532-2	MW-223S_110121	Total/NA	Water	8260B SIM	
MB 240-512758/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512758/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159543-G-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159543-O-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159532-1

Client Sample ID: TRIP BLANK_10

Lab Sample ID: 240-159532-1

Date Collected: 11/01/21 00:00

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512565	11/12/21 02:04	LEE	TAL CAN

Client Sample ID: MW-223S_110121

Lab Sample ID: 240-159532-2

Date Collected: 11/01/21 13:00

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512565	11/12/21 02:26	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512758	11/12/21 19:40	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159532-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	☐ DW ☐ NPDES ☐ RCRA ☐ Other	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500		Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377		Sampler Name: SETH TURNER	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client
Phone: 248-994-2240		Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site		Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04					
PO # 30080642.402.04					

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 10	---	---		X						1					N	G	X	X	X	X	X	X	(CW)	1 Trip Blank
~~MW-215S_ 110121~~ CANCELED (CW)	~~11/1/21~~	~~1355~~		~~6~~						~~6~~					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-223S_ 110121	11/1/21	1300		6						6					N	G	X	X	X	X	X	X	X	↓

240-159532 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com, Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
ST	ARCADIS	11/1/21 / 1500	NOVI COLD STORAGE	ARCADIS	11/1/21 / 1500
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	ARCADIS	11/5/21 / 1435		ETA	11/5/21 1435
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
	ETA	11/5/21 1448	M. A.	ETA	11/6/21 8:00

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11/22/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 159532

Client ARCADIS Site Name

Cooler Received on 11/6/21 Opened on 11/6/21

Cooler unpacked by: Matthew Surma

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 1.0 °C Corrected Cooler Temp. 1.1 °C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
& Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No	(NA) pH Strip Lot# HC157842
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 010-1201G	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present?	Yes	(No)

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.

Sample(s) were received in a broken container.

Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.

Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

DATA VERIFICATION REPORT

November 22, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159532-1
Sample date: 2021-11-01
Report received by CADENA: 2021-11-22
Initial Data Verification completed by CADENA: 2021-11-22
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

MS/MSD recovery outliers or sample duplicate RPD outliers were not determined using a client sample from this submittal for the test and QC batch noted so qualification was not required based on these sample-specific QC outliers:
GCMS VOC QC batch 512565.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia, Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159532-1

		Sample Name:	TRIP BLANK_10				MW-223S_110121			
		Lab Sample ID:	2401595321				2401595322			
		Sample Date:	11/1/2021				11/1/2021			
	Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC										
	OSW-8260B									
	1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Trichloroethene	79-01-6	ND	1.0	ug/l	---	0.67	1.0	ug/l	J
	Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	OSW-8260BBSim									
	1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

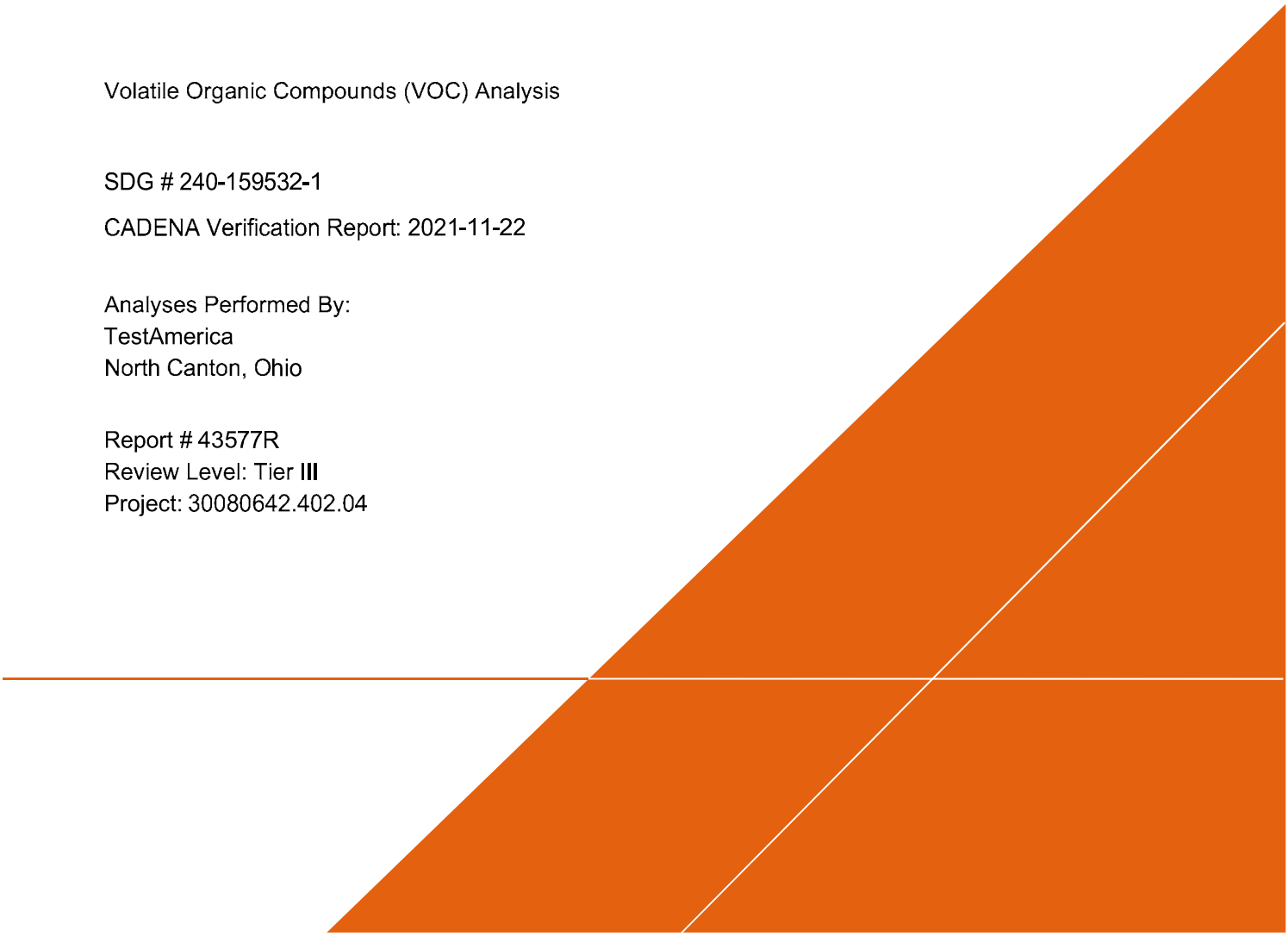
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159532-1

CADENA Verification Report: 2021-11-22

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43577R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159532-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_10	240-159532-1	Water	11/01/21		X	
MW-223S_110121	240-159532-2	Water	11/01/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

DATA REVIEW

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE: 

DATE: December 07, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 8, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	☐ DW ☐ NPDES ☐ RCRA ☐ Other	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500		Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377		Sampler Name: SETH TURNER	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client
Phone: 248-994-2240		Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site		Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04					
PO # 30080642.402.04					

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 10	---	---		X						1					N	G	X	X	X	X	X	X	(CW)	1 Trip Blank
~~MW-215S_ 110121~~ CANCELED (CW)	~~11/1/21~~	~~1355~~		~~6~~						~~6~~					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-223S_ 110121	11/1/21	1300		6						6					N	G	X	X	X	X	X	X	X	↓

240-159532 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com, Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
ST	ARCADIS	11/1/21 / 1500	NOVI COLD STORAGE	ARCADIS	11/1/21 / 1500
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	ARCADIS	11/5/21 / 1435		ETA	11/5/21 1435
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
	ETA	11/5/21 1448	M. A.	ETA	11/6/21 8:00

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11/22/2021

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159532-1

Client Sample ID: TRIP BLANK_10

Date Collected: 11/01/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159532-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 02:04	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 02:04	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 02:04	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 02:04	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 02:04	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 02:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*		*11/12/21 02:04*	*1*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*		*11/12/21 02:04*	*1*
Toluene-d8 (Surr)	*110*		*78 - 122*		*11/12/21 02:04*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/12/21 02:04*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159532-1

Client Sample ID: MW-223S_110121
Date Collected: 11/01/21 13:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159532-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 19:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*11/12/21 19:40*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 02:26	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 02:26	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 02:26	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 02:26	1
Trichloroethene	**0.67**	**J**	1.0	0.44	ug/L			11/12/21 02:26	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 02:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/12/21 02:26*	*1*
4-Bromofluorobenzene (Surr)	*77*		*56 - 136*		*11/12/21 02:26*	*1*
Toluene-d8 (Surr)	*100*		*78 - 122*		*11/12/21 02:26*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/12/21 02:26*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159514-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/22/2021 7:55:52 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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Have a Question? Ask The Expert

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159514-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159514-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159514-1

Comments
No additional comments.

Receipt
The samples were received on 11/6/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.4° C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) for analytical batch 512819 exceeded control criteria for Vinyl Chloride. The samples associated with this CCV were non-detect for the affected analytes. In accordance with the laboratory SOP, a low level CCV at the reporting limit (labeled as an MRL) was analyzed and the affected compounds were detected; therefore the data has been reported. No further corrective action was required: TRIP BLANK_36 (240-159514-1) and MW-191S_110421 (240-159514-2).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159514-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159514-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159514-1	TRIP BLANK_36	Water	11/04/21 00:00	11/06/21 08:00
240-159514-2	MW-191S_110421	Water	11/04/21 13:50	11/06/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159514-1

Client Sample ID: TRIP BLANK_36 — Lab Sample ID: 240-159514-1

No Detections.

Client Sample ID: MW-191S_110421 — Lab Sample ID: 240-159514-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	4.9		1.0	0.46	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159514-1

Client Sample ID: TRIP BLANK_36

Date Collected: 11/04/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159514-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 16:30	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 16:30	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 16:30	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 16:30	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 16:30	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 16:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*122*		*62 - 137*		*11/13/21 16:30*	*1*
4-Bromofluorobenzene (Surr)	*67*		*56 - 136*		*11/13/21 16:30*	*1*
Toluene-d8 (Surr)	*88*		*78 - 122*		*11/13/21 16:30*	*1*
Dibromofluoromethane (Surr)	*107*		*73 - 120*		*11/13/21 16:30*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159514-1

Client Sample ID: MW-191S_110421

Lab Sample ID: 240-159514-2

Date Collected: 11/04/21 13:50

Matrix: Water

Date Received: 11/06/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 01:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*11/12/21 01:49*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 16:51	1
cis-1,2-Dichloroethene	**4.9**		1.0	0.46	ug/L			11/13/21 16:51	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 16:51	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 16:51	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 16:51	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 16:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*126*		*62 - 137*		*11/13/21 16:51*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/13/21 16:51*	*1*
Toluene-d8 (Surr)	*88*		*78 - 122*		*11/13/21 16:51*	*1*
Dibromofluoromethane (Surr)	*111*		*73 - 120*		*11/13/21 16:51*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159514-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159514-1	TRIP BLANK_36	122	67	88	107
240-159514-2	MW-191S_110421	126	70	88	111
240-159546-H-2 MSD	Matrix Spike Duplicate	102	98	101	91
240-159546-K-2 MS	Matrix Spike	105	96	102	93
LCS 240-512819/4	Lab Control Sample	100	99	100	91
MB 240-512819/7	Method Blank	119	75	89	102

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159418-H-2 MS	Matrix Spike	82
240-159418-P-2 MSD	Matrix Spike Duplicate	83
240-159514-2	MW-191S_110421	83
LCS 240-512585/4	Lab Control Sample	81
MB 240-512585/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512819/7
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 13:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 13:57	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 13:57	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:57	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 13:57	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*62 - 137*		*11/13/21 13:57*	*1*
4-Bromofluorobenzene (Surr)	*75*		*56 - 136*		*11/13/21 13:57*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/13/21 13:57*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/13/21 13:57*	*1*

Lab Sample ID: LCS 240-512819/4
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.01		ug/L		90	63 - 134
cis-1,2-Dichloroethene	10.0	10.7		ug/L		107	77 - 123
Tetrachloroethene	10.0	9.49		ug/L		95	76 - 123
trans-1,2-Dichloroethene	10.0	11.0		ug/L		110	75 - 124
Trichloroethene	10.0	9.48		ug/L		95	70 - 122
Vinyl chloride	10.0	8.38		ug/L		84	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*99*		*56 - 136*
Toluene-d8 (Surr)	*100*		*78 - 122*
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Lab Sample ID: 240-159546-H-2 MSD
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	8.50		ug/L		85	56 - 135	11	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.62		ug/L		96	66 - 128	1	14
Tetrachloroethene	1.0	U	10.0	8.67		ug/L		87	62 - 131	16	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.76		ug/L		98	56 - 136	3	15
Trichloroethene	1.0	U	10.0	8.44		ug/L		84	61 - 124	9	15
Vinyl chloride	1.0	U	10.0	7.09		ug/L		71	43 - 157	3	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*
4-Bromofluorobenzene (Surr)	*98*		*56 - 136*
Toluene-d8 (Surr)	*101*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159546-H-2 MSD
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Lab Sample ID: 240-159546-K-2 MS
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	7.61		ug/L		76	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.48		ug/L		95	66 - 128
Tetrachloroethene	1.0	U	10.0	7.41		ug/L		74	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.49		ug/L		95	56 - 136
Trichloroethene	1.0	U	10.0	7.75		ug/L		77	61 - 124
Vinyl chloride	1.0	U	10.0	7.30		ug/L		73	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*
4-Bromofluorobenzene (Surr)	*96*		*56 - 136*
Toluene-d8 (Surr)	*102*		*78 - 122*
Dibromofluoromethane (Surr)	*93*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512585/5
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/11/21 19:04	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/11/21 19:04*	*1*

Lab Sample ID: LCS 240-512585/4
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.86		ug/L		99	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*

Lab Sample ID: 240-159418-H-2 MS
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	11.1		ug/L		111	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159418-P-2 MSD
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.2		ug/L		102	51 - 153	8	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

GC/MS VOA

Analysis Batch: 512585

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159514-2	MW-191S_110421	Total/NA	Water	8260B SIM	
MB 240-512585/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512585/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159418-H-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159418-P-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 512819

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159514-1	TRIP BLANK_36	Total/NA	Water	8260B	
240-159514-2	MW-191S_110421	Total/NA	Water	8260B	
MB 240-512819/7	Method Blank	Total/NA	Water	8260B	
LCS 240-512819/4	Lab Control Sample	Total/NA	Water	8260B	
240-159546-H-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	
240-159546-K-2 MS	Matrix Spike	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159514-1

Client Sample ID: TRIP BLANK_36

Lab Sample ID: 240-159514-1

Date Collected: 11/04/21 00:00

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512819	11/13/21 16:30	LEE	TAL CAN

Client Sample ID: MW-191S_110421

Lab Sample ID: 240-159514-2

Date Collected: 11/04/21 13:50

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512819	11/13/21 16:51	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512585	11/12/21 01:49	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159514-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Allyson Hartz	TAT if different from below		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:	10 day ✓ 2 weeks / 3 weeks / 1 week / 2 days / 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM				Sample Specific Notes / Special Instructions:
TRIP BLANK_ 30	---	---		X						1					N	G	X	X	X	X	X	X	X (EW)				1 Trip Blank
MW-1915_110421	11/4/21	1350		X						6					N	G	X	X	X	X	X	X	X				3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159514 Chain of Custody

Possible Hazard Identification
✓ Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Return to Client ✓ Disposal By Lab Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by:	Arcadis	11/4/21 1530	Received by: Novi cold storage	Arcadis	11/4/21 1530
Relinquished by:	ARCADIS	11/5/21 1435	Received by:	ETA	11/5/21 1435
Relinquished by:	ETA	11/5/21 1446	Received in Laboratory by:	ETA	11/6/21 8:00

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11/22/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 59514

Client ARCADIS Site Name _____

Cooler unpacked by: Matthew Surma

Cooler Received on 11/6/21 Opened on 11/6/21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.3 °C Corrected Cooler Temp. 0.4 °C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes) No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes) No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes (No)
-Were tamper/custody seals intact and uncompromised?	(Yes) No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes (No)
4. Did custody papers accompany the sample(s)?	(Yes) No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes) No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?	
10. Were correct bottle(s) used for the test(s) indicated?	(Yes) No
11. Sufficient quantity received to perform indicated analyses?	(Yes) No
12. Are these work share samples and all listed on the COC?	Yes (No)
If yes, Questions 13-17 have been checked at the originating laboratory.	
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No (NA) pH Strip Lot# HC157842
14. Were VOAs on the COC?	(Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 01042016	(Yes) No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes (No)

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by: [signature]

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

November 22, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159514-1
Sample date: 2021-11-04
Report received by CADENA: 2021-11-22
Initial Data Verification completed by CADENA: 2021-11-22
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159514-1

		Sample Name:	TRIP BLANK_36				MW-191S_110421			
		Lab Sample ID:	2401595141				2401595142			
		Sample Date:	11/4/2021				11/4/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	4.9	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

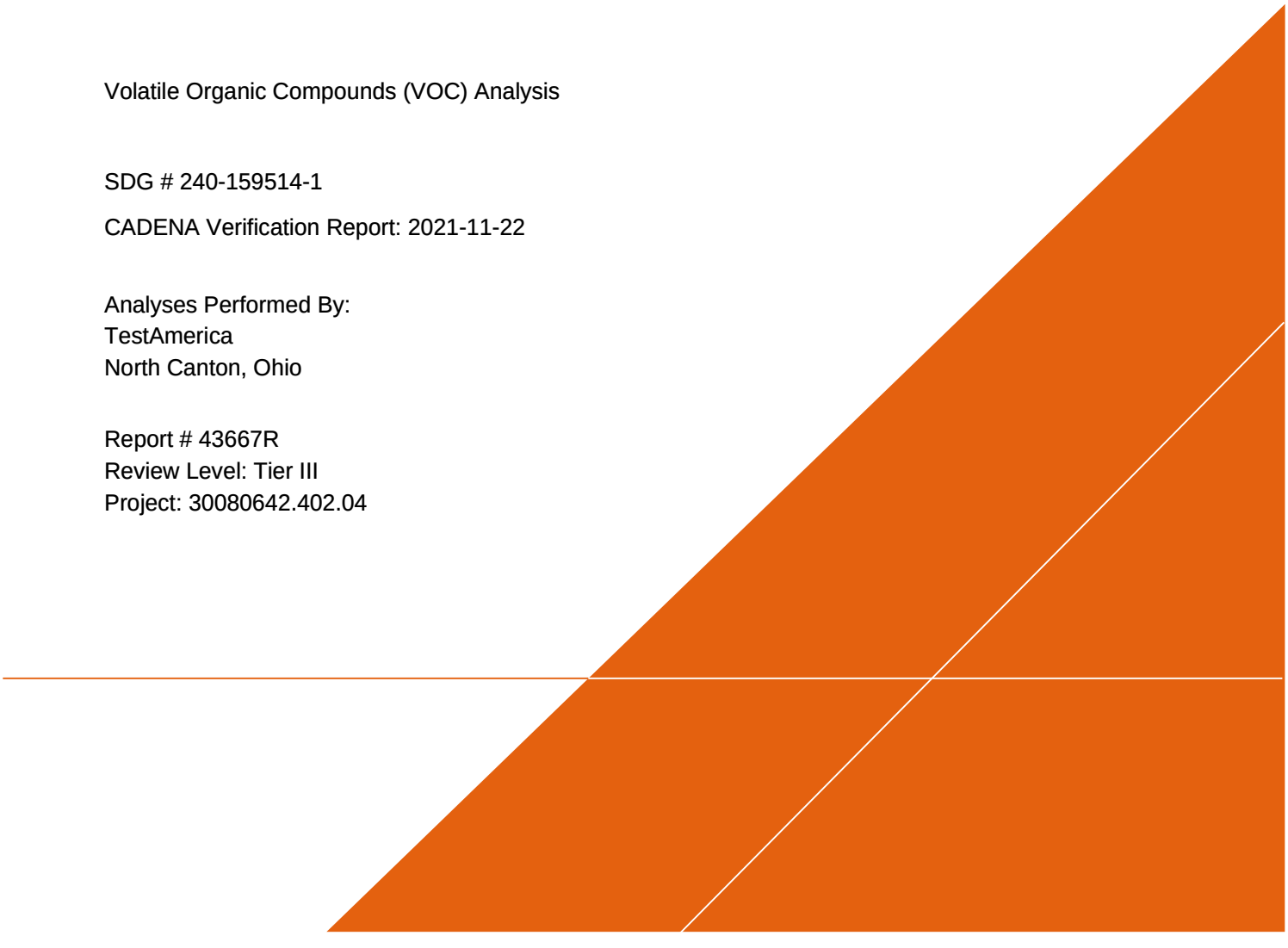
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159514-1

CADENA Verification Report: 2021-11-22

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43667R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159514-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_36	240-159514-1	Water	11/04/21		X	
MW-191S_110421	240-159514-2	Water	11/04/21		X	X

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Compound	Criteria
TRIP BLANK_36 MW-191S_110421	Continuous Calibration Verification %D	Vinyl chloride	-21.2%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	

Initial/Continuing	Criteria	Sample Result	Qualification
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 09, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 09, 2021

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Allyson Hartz	TAT if different from below		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:	10 day — 3 weeks / ✓ 2 weeks / 1 week / 2 days / 1 day		Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM				Sample Specific Notes / Special Instructions:
TRIP BLANK_ 36	—	—		X						1					N	G	X	X	X	X	X	X	X (EW)				1 Trip Blank
MW-1915_110421	11/4/21	1350		X						6					N	G	X	X	X	X	X	X	X				3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159514 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard — Flammable — Skin Irritant — Poison B — Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client — ✓ Disposal By Lab — Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	11/4/21 1530	NOVI cold storage	Arcadis	11/4/21 1530
[signature]	ARCADIS	11/5/21 1435	[signature]	ETA	11/5/21 1435
[signature]	ETA	11/5/21 1446	[signature]	ETA	11/6/21 8:00

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11/22/2021

Client Sample ID: TRIP BLANK_36 — Lab Sample ID: 240-159514-1

Date Collected: 11/04/21 00:00 — **Matrix: Water**
Date Received: 11/06/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 16:30	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 16:30	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 16:30	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 16:30	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 16:30	1
Vinyl chloride	1.0	~~U~~ UJ	1.0	0.45	ug/L			11/13/21 16:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*122*		*62 - 137*		*11/13/21 16:30*	
4-Bromofluorobenzene (Surr)	*67*		*56 - 136*		*11/13/21 16:30*	
Toluene-d8 (Surr)	*88*		*78 - 122*		*11/13/21 16:30*	
Dibromofluoromethane (Surr)	*107*		*73 - 120*		*11/13/21 16:30*	

Client Sample ID: MW-191S_110421 — Lab Sample ID: 240-159514-2

Date Collected: 11/04/21 13:50 — **Matrix: Water**
Date Received: 11/06/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 01:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*11/12/21 01:49*	

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 16:51	1
cis-1,2-Dichloroethene	**4.9**		1.0	0.46	ug/L			11/13/21 16:51	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 16:51	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 16:51	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 16:51	1
Vinyl chloride	1.0	~~U~~ UJ	1.0	0.45	ug/L			11/13/21 16:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*126*		*62 - 137*		*11/13/21 16:51*	
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/13/21 16:51*	
Toluene-d8 (Surr)	*88*		*78 - 122*		*11/13/21 16:51*	
Dibromofluoromethane (Surr)			*73 - 120*		*11/13/21 16:51*	

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159734-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/24/2021 8:33:57 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159734-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159734-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159734-1

Comments
No additional comments.

Receipt
The samples were received on 11/10/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 0.7° C and 0.8° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159734-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159734-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159734-1	TRIP BLANK_85	Water	11/08/21 00:00	11/10/21 08:00
240-159734-2	MW-125S_110821	Water	11/08/21 10:30	11/10/21 08:00
240-159734-3	MW-125_110821	Water	11/08/21 09:35	11/10/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159734-1

Client Sample ID: TRIP BLANK_85 — Lab Sample ID: 240-159734-1

No Detections.

Client Sample ID: MW-125S_110821 — Lab Sample ID: 240-159734-2

No Detections.

Client Sample ID: MW-125_110821 — Lab Sample ID: 240-159734-3

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159734-1

Client Sample ID: TRIP BLANK_85
Date Collected: 11/08/21 00:00
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159734-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 00:08	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 00:08	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 00:08	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 00:08	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 00:08	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 00:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*62 - 137*		*11/19/21 00:08*	*1*
4-Bromofluorobenzene (Surr)	*88*		*56 - 136*		*11/19/21 00:08*	*1*
Toluene-d8 (Surr)	*112*		*78 - 122*		*11/19/21 00:08*	*1*
Dibromofluoromethane (Surr)	*103*		*73 - 120*		*11/19/21 00:08*	*1*

Client Sample ID: MW-125S_110821
Date Collected: 11/08/21 10:30
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159734-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 23:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/17/21 23:34*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 00:30	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 00:30	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 00:30	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 00:30	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 00:30	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 00:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*115*		*62 - 137*		*11/19/21 00:30*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/19/21 00:30*	*1*
Toluene-d8 (Surr)	*104*		*78 - 122*		*11/19/21 00:30*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/19/21 00:30*	*1*

Client Sample ID: MW-125_110821

Date Collected: 11/08/21 09:35
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159734-3

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 23:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/17/21 23:57*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 00:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 00:52	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 00:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 00:52	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 00:52	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 00:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*62 - 137*		*11/19/21 00:52*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/19/21 00:52*	*1*
Toluene-d8 (Surr)	*102*		*78 - 122*		*11/19/21 00:52*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/19/21 00:52*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159734-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159734-1	TRIP BLANK_85	112	88	112	103
240-159734-2	MW-125S_110821	115	82	104	100
240-159734-3	MW-125_110821	108	82	102	96
240-159830-D-2 MS	Matrix Spike	110	86	101	96
240-159830-E-2 MSD	Matrix Spike Duplicate	107	84	97	94
LCS 240-513667/4	Lab Control Sample	101	85	107	94
MB 240-513667/6	Method Blank	110	81	108	98

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159642-H-3 MS	Matrix Spike	87
240-159642-M-3 MSD	Matrix Spike Duplicate	87
240-159734-2	MW-125S_110821	85
240-159734-3	MW-125_110821	85
LCS 240-513480/3	Lab Control Sample	84
MB 240-513480/4	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513667/6
Matrix: Water
Analysis Batch: 513667

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 23:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 23:24	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 23:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 23:24	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 23:24	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 23:24	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*62 - 137*		*11/18/21 23:24*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/18/21 23:24*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/18/21 23:24*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/18/21 23:24*	*1*

Lab Sample ID: LCS 240-513667/4
Matrix: Water
Analysis Batch: 513667

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.6		ug/L		106	63 - 134
cis-1,2-Dichloroethene	10.0	10.7		ug/L		107	77 - 123
Tetrachloroethene	10.0	12.0		ug/L		120	76 - 123
trans-1,2-Dichloroethene	10.0	10.6		ug/L		106	75 - 124
Trichloroethene	10.0	9.72		ug/L		97	70 - 122
Vinyl chloride	10.0	7.48		ug/L		75	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*101*		*62 - 137*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*
Toluene-d8 (Surr)	*107*		*78 - 122*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: 240-159830-D-2 MS
Matrix: Water
Analysis Batch: 513667

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	8.06		ug/L		81	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.32		ug/L		93	66 - 128
Tetrachloroethene	1.0	U	10.0	9.01		ug/L		90	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.50		ug/L		95	56 - 136
Trichloroethene	1.0	U	10.0	8.17		ug/L		82	61 - 124
Vinyl chloride	1.0	U	10.0	7.02		ug/L		70	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*110*		*62 - 137*
4-Bromofluorobenzene (Surr)	*86*		*56 - 136*
Toluene-d8 (Surr)	*101*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159830-D-2 MS
Matrix: Water
Analysis Batch: 513667

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	96		73 - 120

Lab Sample ID: 240-159830-E-2 MSD
Matrix: Water
Analysis Batch: 513667

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	7.67		ug/L		77	56 - 135	5	26
cis-1,2-Dichloroethene	1.0	U	10.0	8.48		ug/L		85	66 - 128	9	14
Tetrachloroethene	1.0	U	10.0	8.29		ug/L		83	62 - 131	8	20
trans-1,2-Dichloroethene	1.0	U	10.0	8.31		ug/L		83	56 - 136	13	15
Trichloroethene	1.0	U	10.0	7.56		ug/L		76	61 - 124	8	15
Vinyl chloride	1.0	U	10.0	6.48		ug/L		65	43 - 157	8	24

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	107		62 - 137
4-Bromofluorobenzene (Surr)	84		56 - 136
Toluene-d8 (Surr)	97		78 - 122
Dibromofluoromethane (Surr)	94		73 - 120

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513480/4
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 19:58	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	84		66 - 120		11/17/21 19:58	1

Lab Sample ID: LCS 240-513480/3
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.37		ug/L		94	80 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	84		66 - 120

Lab Sample ID: 240-159642-H-3 MS
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.3		ug/L		103	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

Lab Sample ID: 240-159642-M-3 MSD
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.57		ug/L		96	51 - 153	7	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159734-1

GC/MS VOA

Analysis Batch: 513480

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159734-2	MW-125S_110821	Total/NA	Water	8260B SIM	
240-159734-3	MW-125_110821	Total/NA	Water	8260B SIM	
MB 240-513480/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513480/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159642-H-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159642-M-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513667

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159734-1	TRIP BLANK_85	Total/NA	Water	8260B	
240-159734-2	MW-125S_110821	Total/NA	Water	8260B	
240-159734-3	MW-125_110821	Total/NA	Water	8260B	
MB 240-513667/6	Method Blank	Total/NA	Water	8260B	
LCS 240-513667/4	Lab Control Sample	Total/NA	Water	8260B	
240-159830-D-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159830-E-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159734-1

Client Sample ID: TRIP BLANK_85

Lab Sample ID: 240-159734-1
Matrix: Water
Date Collected: 11/08/21 00:00
Date Received: 11/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513667	11/19/21 00:08	LEE	TAL CAN

Client Sample ID: MW-125S_110821

Lab Sample ID: 240-159734-2
Matrix: Water
Date Collected: 11/08/21 10:30
Date Received: 11/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513667	11/19/21 00:30	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513480	11/17/21 23:34	CS	TAL CAN

Client Sample ID: MW-125_110821

Lab Sample ID: 240-159734-3
Matrix: Water
Date Collected: 11/08/21 09:35
Date Received: 11/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513667	11/19/21 00:52	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513480	11/17/21 23:57	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159734-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Seth Turner	TAT if different from below		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:	10 day ✓ 2 weeks / 3 weeks / 1 week / 2 days / 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_85	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-125S_110821	11/8/21	0930		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-125_110821	11/8/21	935		X						6					N	G	X	X	X	X	X	X	X	1

240-159734 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client ✓ Disposal By Lab Archive For Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by:	Arcadis	11/8/21 1330	Received by: Novi cold storage	Arcadis	11/8/21 1330
Relinquished by:	ARCADIS	11/9/21 1040	Received by:	ETA	11/9/21 1040
Relinquished by:	ETA	11/9/21 1055	Received in Laboratory by: Mandalyn Block	ETA	11-10-21 8:00

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11/24/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 159734

Client Arcadis Site Name

Cooler Received on 11-10-21 Opened on 11-10-21

Cooler unpacked by: Marilyn Beaver

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: ~~Bubble Wrap~~ Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity_____	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC157842
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #_____	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

NO $IM on TB per corrected COC. DMC 11/10/21

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

Login # : 159734

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form				
Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
(1) Client Box Other	(IR-14) IR-15	0-6	0-7	(Wet Ice) Blue Ice Dry Ice Water None
(A) Client Box Other	(IR-14) IR-15	0-7	0-8	(Wet Ice) Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
☐ See Temperature Excursion Form				

WI-NC-099 Cooler Receipt Form Page 2 – Multiple Coolers

DATA VERIFICATION REPORT

November 24, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159734-1
Sample date: 2021-11-08
Report received by CADENA: 2021-11-24
Initial Data Verification completed by CADENA: 2021-11-24
Number of Samples:3
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159734-1

		Sample Name:	TRIP BLANK_85				MW-125S_110821				MW-125_110821			
		Lab Sample ID:	2401597341				2401597342				2401597343			
		Sample Date:	11/8/2021				11/8/2021				11/8/2021			
Analyte	Cas No.		Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC														
OSW-8260B														
1,1-Dichloroethene	75-35-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim														
1,4-Dioxane	123-91-1						ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

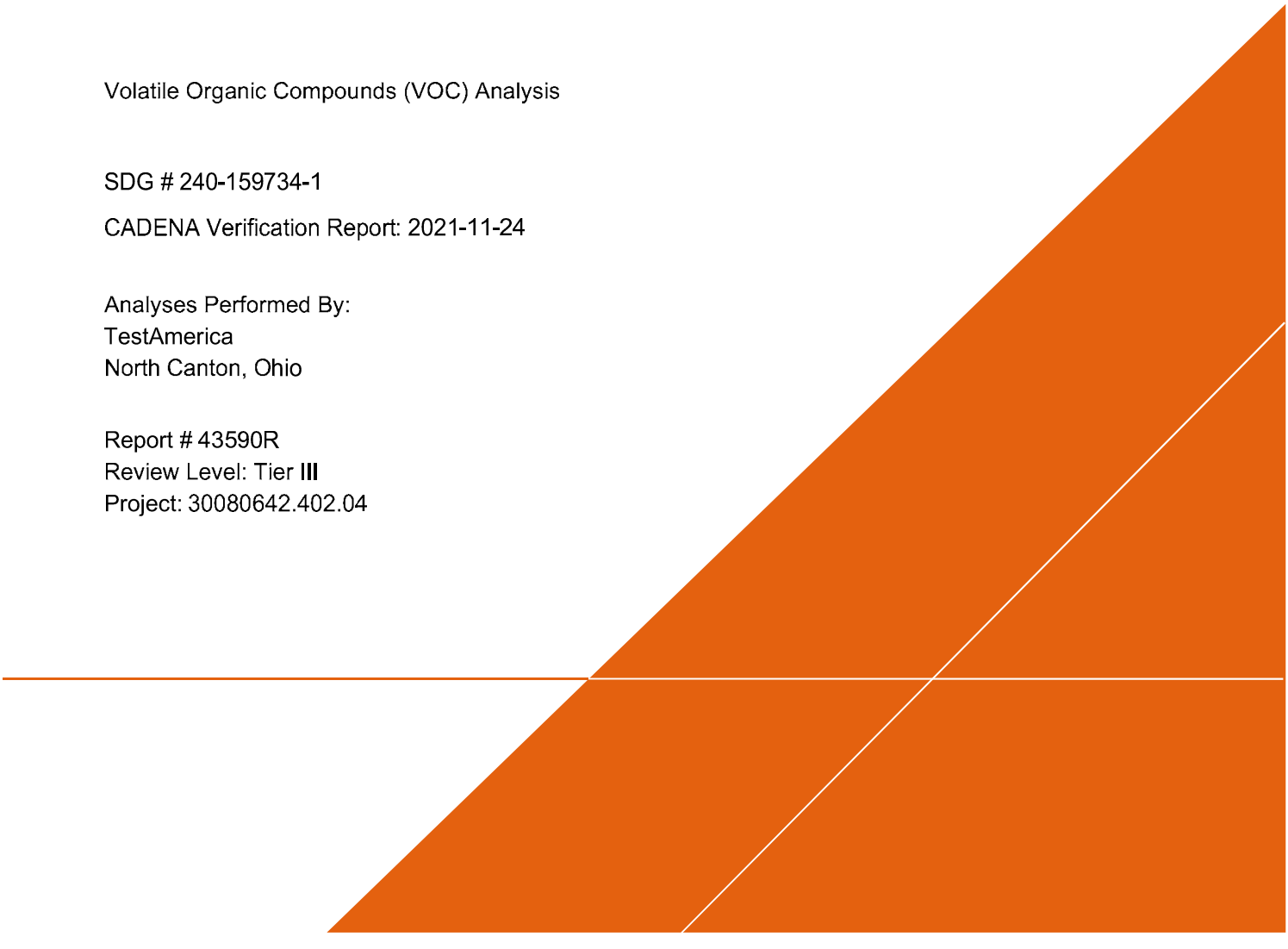
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159734-1

CADENA Verification Report: 2021-11-24

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43590R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159734-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_85	240-159734-1	Water	11/08/21		X	
MW-125S_110821	240-159734-2	Water	11/08/21		X	X
MW-125_110821	240-159734-3	Water	11/08/21		X	X

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.
  - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
  - E The compound was quantitated above the calibration range.
  - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
  - J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
  - UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
  - J+ The result is an estimated quantity, but the result may be biased high.
  - J- The result is an estimated quantity, but the result may be biased low.
  - UB Analyte considered non-detect at the listed value due to associated blank contamination.
  - N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
  - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE: 

DATE: December 14, 2021

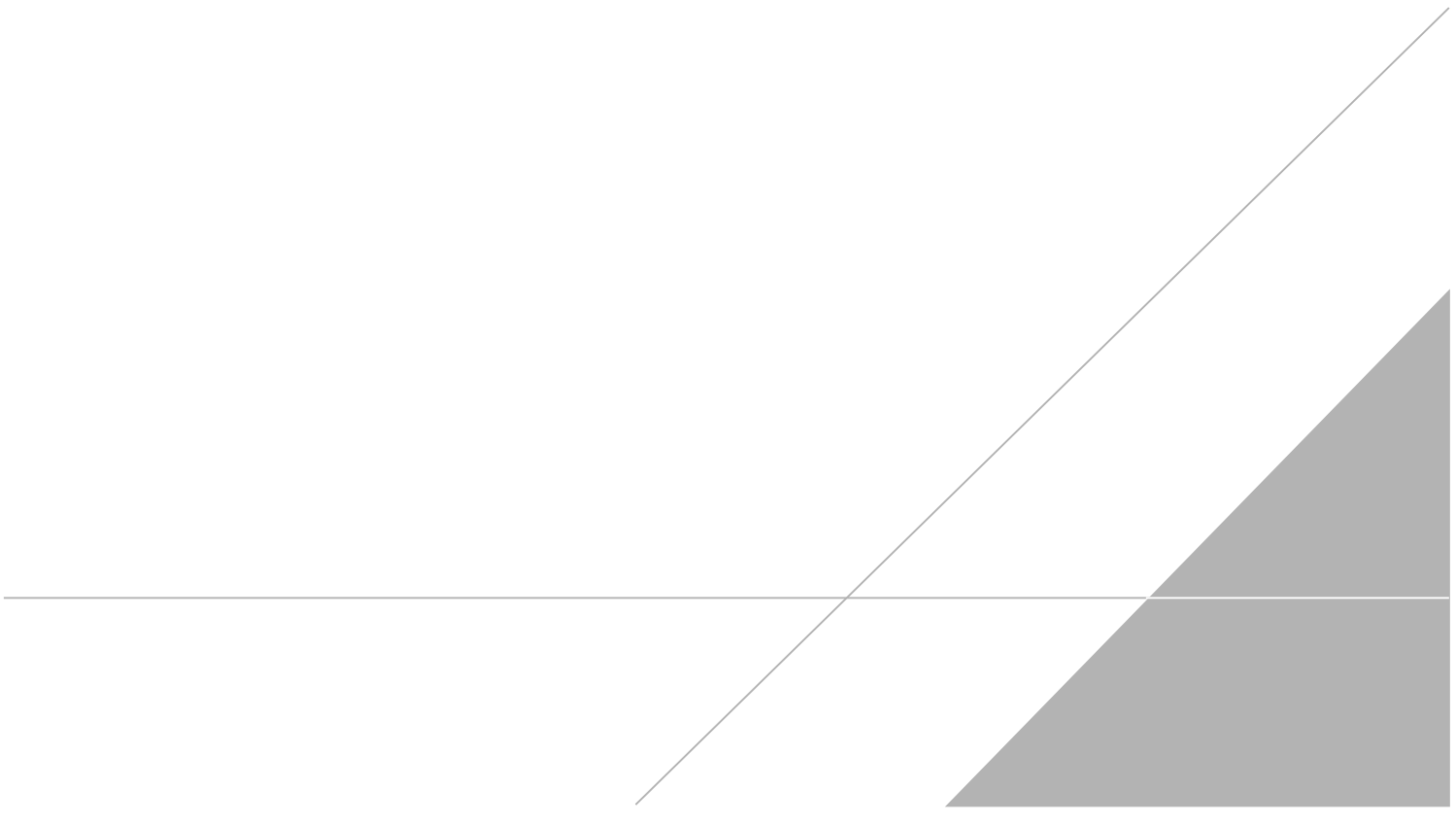
PEER REVIEW: Andrew Korycinski

DATE: December 14, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



MICHIGAN 190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Seth Turner	TAT if different from below		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:	10 day ✓ 2 weeks / 3 weeks / 1 week / 2 days / 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_85	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-125S_110821	11/8/21	0930		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-125_110821	11/8/21	935		X						6					N	G	X	X	X	X	X	X	X	1

240-159734 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client ✓ Disposal By Lab Archive For Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by:	Arcadis	11/8/21 1330	Received by: Novi cold storage	Arcadis	11/8/21 1330
Relinquished by:	ARCADIS	11/9/21 1040	Received by:	ETA	11/9/21 1040
Relinquished by:	ETA	11/9/21 1055	Received in Laboratory by: Mandalyn Block	ETA	11-10-21 8:00

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11/24/2021

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159734-1

Client Sample ID: TRIP BLANK_85
Date Collected: 11/08/21 00:00
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159734-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 00:08	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 00:08	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 00:08	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 00:08	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 00:08	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 00:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*62 - 137*		*11/19/21 00:08*	*1*
4-Bromofluorobenzene (Surr)	*88*		*56 - 136*		*11/19/21 00:08*	*1*
Toluene-d8 (Surr)	*112*		*78 - 122*		*11/19/21 00:08*	*1*
Dibromofluoromethane (Surr)	*103*		*73 - 120*		*11/19/21 00:08*	*1*

Client Sample ID: MW-125S_110821
Date Collected: 11/08/21 10:30
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159734-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 23:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/17/21 23:34*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 00:30	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 00:30	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 00:30	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 00:30	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 00:30	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 00:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*115*		*62 - 137*		*11/19/21 00:30*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/19/21 00:30*	*1*
Toluene-d8 (Surr)	*104*		*78 - 122*		*11/19/21 00:30*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/19/21 00:30*	*1*

Client Sample ID: MW-125_110821

Date Collected: 11/08/21 09:35
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159734-3

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 23:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/17/21 23:57*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 00:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 00:52	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 00:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 00:52	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 00:52	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 00:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*62 - 137*		*11/19/21 00:52*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/19/21 00:52*	*1*
Toluene-d8 (Surr)	*102*		*78 - 122*		*11/19/21 00:52*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/19/21 00:52*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159540-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/22/2021 10:23:54 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159540-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159540-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159540-1

Comments
No additional comments.

Receipt
The samples were received on 11/6/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.4° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159540-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159540-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159540-1	TRIP BLANK_35	Water	11/04/21 00:00	11/06/21 08:00
240-159540-2	MW-129S_110421	Water	11/04/21 11:16	11/06/21 08:00
240-159540-3	MW-129_110421	Water	11/04/21 12:06	11/06/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159540-1

Client Sample ID: TRIP BLANK_35 — Lab Sample ID: 240-159540-1

No Detections.

Client Sample ID: MW-129S_110421 — Lab Sample ID: 240-159540-2

No Detections.

Client Sample ID: MW-129_110421 — Lab Sample ID: 240-159540-3

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159540-1

Client Sample ID: TRIP BLANK_35
Date Collected: 11/04/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159540-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/15/21 12:42	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/15/21 12:42	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 12:42	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/15/21 12:42	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 12:42	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/15/21 12:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*122*		*62 - 137*		*11/15/21 12:42*	*1*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*		*11/15/21 12:42*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*11/15/21 12:42*	*1*
Dibromofluoromethane (Surr)	*111*		*73 - 120*		*11/15/21 12:42*	*1*

Client Sample ID: MW-129S_110421
Date Collected: 11/04/21 11:16
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159540-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 21:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*11/12/21 21:40*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/15/21 13:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/15/21 13:57	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 13:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/15/21 13:57	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 13:57	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/15/21 13:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*113*		*62 - 137*		*11/15/21 13:57*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/15/21 13:57*	*1*
Toluene-d8 (Surr)	*94*		*78 - 122*		*11/15/21 13:57*	*1*
Dibromofluoromethane (Surr)	*107*		*73 - 120*		*11/15/21 13:57*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159540-1

Client Sample ID: MW-129_110421

Lab Sample ID: 240-159540-3

Date Collected: 11/04/21 12:06

Matrix: Water

Date Received: 11/06/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 22:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*11/12/21 22:04*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/15/21 14:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/15/21 14:22	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 14:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/15/21 14:22	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 14:22	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/15/21 14:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*62 - 137*		*11/15/21 14:22*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/15/21 14:22*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*11/15/21 14:22*	*1*
Dibromofluoromethane (Surr)	*110*		*73 - 120*		*11/15/21 14:22*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159540-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159540-1	TRIP BLANK_35	122	87	95	111
240-159540-2	MW-129S_110421	113	81	94	107
240-159540-3	MW-129_110421	119	82	95	110
240-159541-H-2 MS	Matrix Spike	104	104	100	106
240-159541-N-2 MSD	Matrix Spike Duplicate	103	101	95	102
LCS 240-512931/5	Lab Control Sample	107	100	96	105
MB 240-512931/7	Method Blank	121	87	95	109

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159540-2	MW-129S_110421	83
240-159540-3	MW-129_110421	82
240-159543-G-3 MS	Matrix Spike	85
240-159543-O-3 MSD	Matrix Spike Duplicate	83
LCS 240-512758/4	Lab Control Sample	83
MB 240-512758/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512931/7
Matrix: Water
Analysis Batch: 512931

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/15/21 12:17	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/15/21 12:17	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 12:17	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/15/21 12:17	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 12:17	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/15/21 12:17	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*121*		*62 - 137*		*11/15/21 12:17*	*1*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*		*11/15/21 12:17*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*11/15/21 12:17*	*1*
Dibromofluoromethane (Surr)	*109*		*73 - 120*		*11/15/21 12:17*	*1*

Lab Sample ID: LCS 240-512931/5
Matrix: Water
Analysis Batch: 512931

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	25.7		ug/L		103	63 - 134
cis-1,2-Dichloroethene	25.0	24.0		ug/L		96	77 - 123
Tetrachloroethene	25.0	29.9		ug/L		120	76 - 123
trans-1,2-Dichloroethene	25.0	25.4		ug/L		101	75 - 124
Trichloroethene	25.0	25.9		ug/L		104	70 - 122
Vinyl chloride	25.0	26.9		ug/L		108	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*107*		*62 - 137*
4-Bromofluorobenzene (Surr)	*100*		*56 - 136*
Toluene-d8 (Surr)	*96*		*78 - 122*
Dibromofluoromethane (Surr)	*105*		*73 - 120*

Lab Sample ID: 240-159541-H-2 MS
Matrix: Water
Analysis Batch: 512931

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	25.0	23.9		ug/L		95	56 - 135
cis-1,2-Dichloroethene	1.0	U	25.0	22.8		ug/L		91	66 - 128
Tetrachloroethene	1.0	U	25.0	30.6		ug/L		122	62 - 131
trans-1,2-Dichloroethene	1.0	U	25.0	22.7		ug/L		91	56 - 136
Trichloroethene	1.0	U	25.0	23.3		ug/L		93	61 - 124
Vinyl chloride	1.0	U	25.0	23.4		ug/L		94	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*104*		*62 - 137*
4-Bromofluorobenzene (Surr)	*104*		*56 - 136*
Toluene-d8 (Surr)	*100*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159541-H-2 MS
Matrix: Water
Analysis Batch: 512931

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*106*		*73 - 120*

Lab Sample ID: 240-159541-N-2 MSD
Matrix: Water
Analysis Batch: 512931

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	25.0	22.9		ug/L		91	56 - 135	4	26
cis-1,2-Dichloroethene	1.0	U	25.0	22.5		ug/L		90	66 - 128	1	14
Tetrachloroethene	1.0	U	25.0	30.4		ug/L		121	62 - 131	1	20
trans-1,2-Dichloroethene	1.0	U	25.0	22.2		ug/L		89	56 - 136	2	15
Trichloroethene	1.0	U	25.0	23.2		ug/L		93	61 - 124	0	15
Vinyl chloride	1.0	U	25.0	22.1		ug/L		88	43 - 157	6	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*
4-Bromofluorobenzene (Surr)	*101*		*56 - 136*
Toluene-d8 (Surr)	*95*		*78 - 122*
Dibromofluoromethane (Surr)	*102*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512758/5
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 16:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/12/21 16:51*	*1*

Lab Sample ID: LCS 240-512758/4
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.63		ug/L		96	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

Lab Sample ID: 240-159543-G-3 MS
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	9.98		ug/L		100	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

Lab Sample ID: 240-159543-O-3 MSD
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.71		ug/L		97	51 - 153	3	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159540-1

GC/MS VOA

Analysis Batch: 512758

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159540-2	MW-129S_110421	Total/NA	Water	8260B SIM	
240-159540-3	MW-129_110421	Total/NA	Water	8260B SIM	
MB 240-512758/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512758/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159543-G-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159543-O-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 512931

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159540-1	TRIP BLANK_35	Total/NA	Water	8260B	
240-159540-2	MW-129S_110421	Total/NA	Water	8260B	
240-159540-3	MW-129_110421	Total/NA	Water	8260B	
MB 240-512931/7	Method Blank	Total/NA	Water	8260B	
LCS 240-512931/5	Lab Control Sample	Total/NA	Water	8260B	
240-159541-H-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159541-N-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159540-1

Client Sample ID: TRIP BLANK_35

Lab Sample ID: 240-159540-1
Date Collected: 11/04/21 00:00
Matrix: Water
Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512931	11/15/21 12:42	SAM	TAL CAN

Client Sample ID: MW-129S_110421

Lab Sample ID: 240-159540-2
Date Collected: 11/04/21 11:16
Matrix: Water
Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512931	11/15/21 13:57	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	512758	11/12/21 21:40	CS	TAL CAN

Client Sample ID: MW-129_110421

Lab Sample ID: 240-159540-3
Date Collected: 11/04/21 12:06
Matrix: Water
Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512931	11/15/21 14:22	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	512758	11/12/21 22:04	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159540-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	DW / NPDES / RCRA / Other			
Address: 28550 Cabot Drive, Suite 500	Client Project Manager: Kris Hinskey	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Telephone: 248-994-2240	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Email: kristoffer.hinskey@arcadis.com	TAT if different from below		Walk-in client
Project Name: Ford LTP Off-Site	Sampler Name: Allyson Hartz	10 day — 3 weeks / ✓ 2 weeks / 1 week / 2 days / 1 day		Lab sampling
Project Number: 30080642.402.04	Method of Shipment/Carrier:			Job/SDG No:
PO # 30080642.402.04	Shipping/Tracking No:			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_35	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-129S_110421	11/4/21	1116		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-129_110421	11/4/21	1206		X						6					N	G	X	X	X	X	X	X	X	↓

240-159540 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / ✓ Disposal ByLab / Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[illegible]	Arcadis	11/4/21 1530	Novi Cold Storage	Arcadis	11/4/21 1530
[illegible]	ARCADIS	11/5/21 1435	[illegible]	ETA	11/5/21 1435
[illegible]	ETA	11/5/21 1448	M. L. S.	ETA	11/6/21 8:00

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 159540
Canton Facility

Client ARCADIS Site Name

Cooler unpacked by: Matthew Surma

Cooler Received on 11/6/21 Opened on 11/6/21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.3 °C Corrected Cooler Temp. 0.4 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# HC157842
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 0104201G (Yes) No
17. Was a LL Hg or Me Hg trip blank present? Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

November 22, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159540-1
Sample date: 2021-11-04
Report received by CADENA: 2021-11-22
Initial Data Verification completed by CADENA: 2021-11-22
Number of Samples:3
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159540-1

		Sample Name:	TRIP BLANK_35				MW-129S_110421				MW-129_110421			
		Lab Sample ID:	2401595401				2401595402				2401595403			
		Sample Date:	11/4/2021				11/4/2021				11/4/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC													
OSW-8260B													
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim													
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

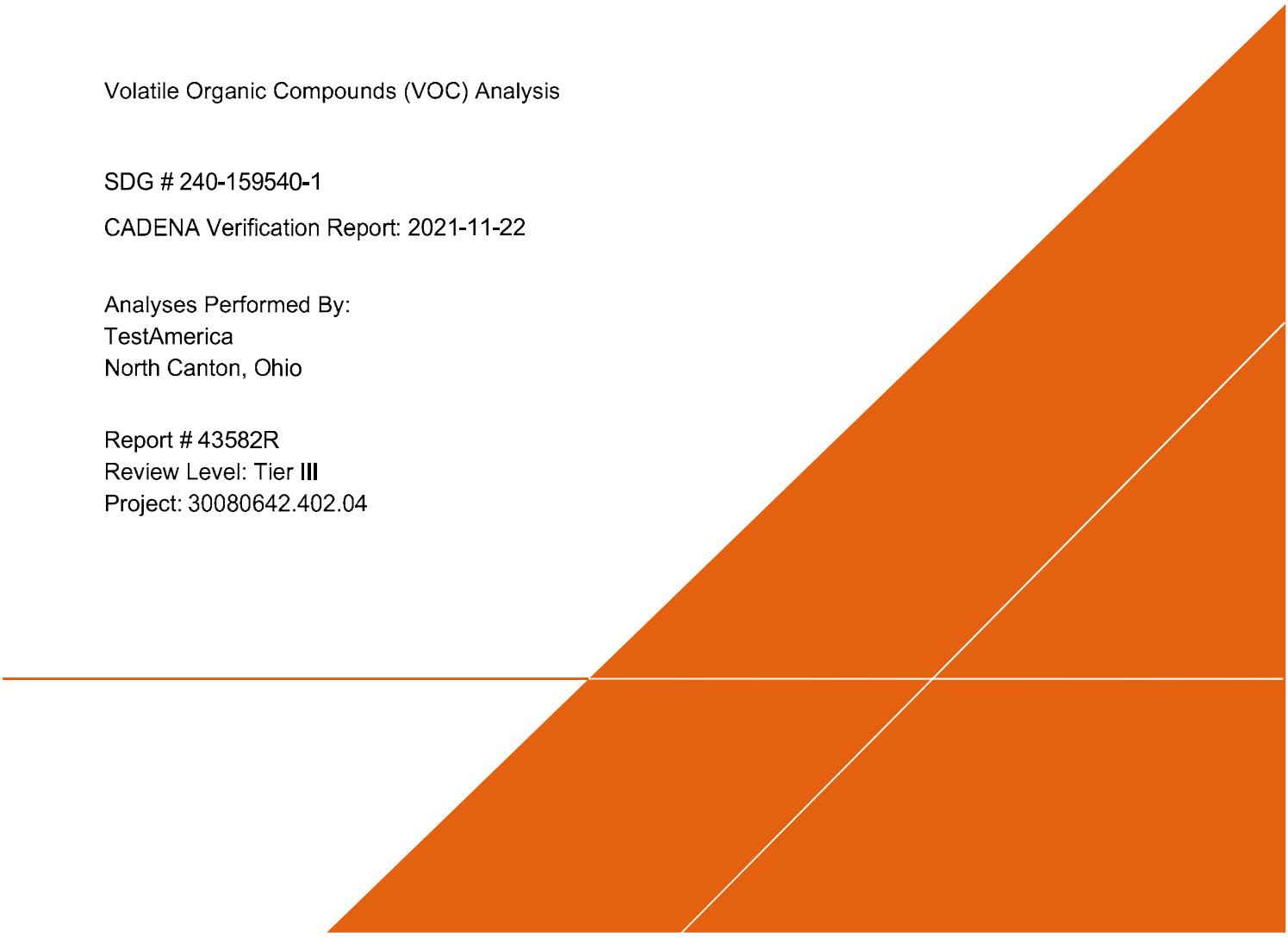
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159540-1

CADENA Verification Report: 2021-11-22

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43582R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159540-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_35	240-159540-1	Water	11/04/21		X	
MW-129S_110421	240-159540-2	Water	11/04/21		X	X
MW-129_110421	240-159540-3	Water	11/04/21		X	X

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE: 

DATE: December 14, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 14, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	DW / NPDES / RCRA / Other			
Address: 28550 Cabot Drive, Suite 500	Client Project Manager: Kris Hinskey	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Telephone: 248-994-2240	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Email: kristoffer.hinskey@arcadis.com	TAT if different from below		Walk-in client
Project Name: Ford LTP Off-Site	Sampler Name: Allyson Hartz	10 day — 3 weeks / ✓ 2 weeks / 1 week / 2 days / 1 day		Lab sampling
Project Number: 30080642.402.04	Method of Shipment/Carrier:			Job/SDG No:
PO # 30080642.402.04	Shipping/Tracking No:			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_35	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-129S_110421	11/4/21	1116		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-129_110421	11/4/21	1206		X						6					N	G	X	X	X	X	X	X	X	↓

240-159540 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / ✓ Disposal ByLab / Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[illegible]	Arcadis	11/4/21 1530	Novi Cold Storage	Arcadis	11/4/21 1530
[illegible]	ARCADIS	11/5/21 1435	[illegible]	ETA	11/5/21 1435
[illegible]	ETA	11/5/21 1448	M. L. S.	ETA	11/6/21 8:00

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Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159540-1

Client Sample ID: TRIP BLANK_35
Date Collected: 11/04/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159540-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/15/21 12:42	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/15/21 12:42	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 12:42	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/15/21 12:42	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 12:42	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/15/21 12:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*122*		*62 - 137*		*11/15/21 12:42*	*1*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*		*11/15/21 12:42*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*11/15/21 12:42*	*1*
Dibromofluoromethane (Surr)	*111*		*73 - 120*		*11/15/21 12:42*	*1*

Client Sample ID: MW-129S_110421
Date Collected: 11/04/21 11:16
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159540-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 21:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*11/12/21 21:40*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/15/21 13:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/15/21 13:57	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 13:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/15/21 13:57	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 13:57	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/15/21 13:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*113*		*62 - 137*		*11/15/21 13:57*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/15/21 13:57*	*1*
Toluene-d8 (Surr)	*94*		*78 - 122*		*11/15/21 13:57*	*1*
Dibromofluoromethane (Surr)	*107*		*73 - 120*		*11/15/21 13:57*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159540-1

Client Sample ID: MW-129_110421

Lab Sample ID: 240-159540-3

Date Collected: 11/04/21 12:06

Matrix: Water

Date Received: 11/06/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 22:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*11/12/21 22:04*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/15/21 14:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/15/21 14:22	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 14:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/15/21 14:22	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 14:22	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/15/21 14:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*62 - 137*		*11/15/21 14:22*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/15/21 14:22*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*11/15/21 14:22*	*1*
Dibromofluoromethane (Surr)	*110*		*73 - 120*		*11/15/21 14:22*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159532-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/22/2021 9:28:46 AM

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Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159532-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159532-1

Job ID: 240-159532-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159532-1

Comments
No additional comments.

Receipt
The samples were received on 11/6/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.1º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159532-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159532-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159532-1	TRIP BLANK_10	Water	11/01/21 00:00	11/06/21 08:00
240-159532-2	MW-223S_110121	Water	11/01/21 13:00	11/06/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159532-1

Client Sample ID: TRIP BLANK_10 — Lab Sample ID: 240-159532-1

No Detections.

Client Sample ID: MW-223S_110121 — Lab Sample ID: 240-159532-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Trichloroethene	0.67	J	1.0	0.44	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159532-1

Client Sample ID: TRIP BLANK_10

Date Collected: 11/01/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159532-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 02:04	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 02:04	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 02:04	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 02:04	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 02:04	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 02:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*		*11/12/21 02:04*	*1*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*		*11/12/21 02:04*	*1*
Toluene-d8 (Surr)	*110*		*78 - 122*		*11/12/21 02:04*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/12/21 02:04*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159532-1

Client Sample ID: MW-223S_110121
Date Collected: 11/01/21 13:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159532-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 19:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*11/12/21 19:40*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 02:26	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 02:26	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 02:26	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 02:26	1
Trichloroethene	**0.67**	**J**	1.0	0.44	ug/L			11/12/21 02:26	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 02:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/12/21 02:26*	*1*
4-Bromofluorobenzene (Surr)	*77*		*56 - 136*		*11/12/21 02:26*	*1*
Toluene-d8 (Surr)	*100*		*78 - 122*		*11/12/21 02:26*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/12/21 02:26*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159532-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159532-1	TRIP BLANK_10	100	85	110	100
240-159532-2	MW-223S_110121	93	77	100	94
240-159539-B-5 MS	Matrix Spike	96	94	116	97
240-159539-B-5 MSD	Matrix Spike Duplicate	90	87	108	92
LCS 240-512565/4	Lab Control Sample	89	87	107	90
MB 240-512565/6	Method Blank	92	73	102	90

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159532-2	MW-223S_110121	83
240-159543-G-3 MS	Matrix Spike	85
240-159543-O-3 MSD	Matrix Spike Duplicate	83
LCS 240-512758/4	Lab Control Sample	83
MB 240-512758/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512565/6
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 23:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 23:50	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 23:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 23:50	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 23:50	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 23:50	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/11/21 23:50*	*1*
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*11/11/21 23:50*	*1*
Toluene-d8 (Surr)	*102*		*78 - 122*		*11/11/21 23:50*	*1*
Dibromofluoromethane (Surr)	*90*		*73 - 120*		*11/11/21 23:50*	*1*

Lab Sample ID: LCS 240-512565/4
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.4		ug/L		104	63 - 134
cis-1,2-Dichloroethene	10.0	10.1		ug/L		101	77 - 123
Tetrachloroethene	10.0	10.6		ug/L		106	76 - 123
trans-1,2-Dichloroethene	10.0	10.1		ug/L		101	75 - 124
Trichloroethene	10.0	8.95		ug/L		90	70 - 122
Vinyl chloride	10.0	9.56		ug/L		96	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*107*		*78 - 122*
Dibromofluoromethane (Surr)	*90*		*73 - 120*

Lab Sample ID: 240-159539-B-5 MS
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25	U	250	224		ug/L		90	56 - 135
cis-1,2-Dichloroethene	43		250	285		ug/L		97	66 - 128
Tetrachloroethene	25	U	250	201		ug/L		80	62 - 131
trans-1,2-Dichloroethene	86		250	316		ug/L		92	56 - 136
Trichloroethene	830	F1	250	936	F1	ug/L		41	61 - 124
Vinyl chloride	25	U	250	246		ug/L		99	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*
Toluene-d8 (Surr)	*116*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159539-B-5 MS
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*97*		*73 - 120*

Lab Sample ID: 240-159539-B-5 MSD
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	25	U	250	213		ug/L		85	56 - 135	5	26
cis-1,2-Dichloroethene	43		250	272		ug/L		92	66 - 128	5	14
Tetrachloroethene	25	U	250	210		ug/L		84	62 - 131	4	20
trans-1,2-Dichloroethene	86		250	297		ug/L		84	56 - 136	6	15
Trichloroethene	830	F1	250	885	F1	ug/L		21	61 - 124	6	15
Vinyl chloride	25	U	250	233		ug/L		93	43 - 157	6	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*108*		*78 - 122*
Dibromofluoromethane (Surr)	*92*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512758/5
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 16:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/12/21 16:51*	*1*

Lab Sample ID: LCS 240-512758/4
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.63		ug/L		96	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

Lab Sample ID: 240-159543-G-3 MS
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	9.98		ug/L		100	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

Lab Sample ID: 240-159543-O-3 MSD
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.71		ug/L		97	51 - 153	3	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159532-1

GC/MS VOA

Analysis Batch: 512565

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159532-1	TRIP BLANK_10	Total/NA	Water	8260B	
240-159532-2	MW-223S_110121	Total/NA	Water	8260B	
MB 240-512565/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512565/4	Lab Control Sample	Total/NA	Water	8260B	
240-159539-B-5 MS	Matrix Spike	Total/NA	Water	8260B	
240-159539-B-5 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 512758

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159532-2	MW-223S_110121	Total/NA	Water	8260B SIM	
MB 240-512758/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512758/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159543-G-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159543-O-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159532-1

Client Sample ID: TRIP BLANK_10

Lab Sample ID: 240-159532-1

Date Collected: 11/01/21 00:00

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512565	11/12/21 02:04	LEE	TAL CAN

Client Sample ID: MW-223S_110121

Lab Sample ID: 240-159532-2

Date Collected: 11/01/21 13:00

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512565	11/12/21 02:26	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512758	11/12/21 19:40	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159532-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: SETH TURNER	TAT if different from below: 10 day; ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_10	---	---		X						1					N	G	X	X	X	X	X	X	(CW)	1 Trip Blank
~~MW-215S_110121~~ CANCELED (CW)	~~11/1/21~~	~~1355~~		~~6~~						~~6~~					~~N~~	~~G~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~3 VOAs for 8260B~~ ~~3 VOAs for 8260B SIM~~
MW-223S_110121	11/1/21	1300		6						6					N	G	X	X	X	X	X	X	X	↓

240-159532 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: ST	ARCADIS	11/1/21 / 1500	Received by: NOVI COLD STORAGE	ARCADIS	11/1/21 / 1500
Relinquished by: [signature]	ARCADIS	11/5/21 / 1435	Received by: [signature]	ETA	11/5/21 1435
Relinquished by: [signature]	ETA	11/5/21 1448	Received in Laboratory by: M. A.	ETA	11/6/21 8:00

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11/22/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 159532

Client ARCADIS Site Name

Cooler Received on 11/6/21 Opened on 11/6/21

Cooler unpacked by: Matthew Surma

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 1.0 °C Corrected Cooler Temp. 1.1 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y)N), # of containers (Y)N), and sample type of grab/comp(Y)N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# **HC157842**
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 010420 16 (Yes) No
17. Was a LL Hg or Me Hg trip blank present? ____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

WI-NC-099

DATA VERIFICATION REPORT

November 22, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159532-1
Sample date: 2021-11-01
Report received by CADENA: 2021-11-22
Initial Data Verification completed by CADENA: 2021-11-22
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

MS/MSD recovery outliers or sample duplicate RPD outliers were not determined using a client sample from this submittal for the test and QC batch noted so qualification was not required based on these sample-specific QC outliers:
GCMS VOC QC batch 512565.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia, Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159532-1

		Sample Name:	TRIP BLANK_10				MW-223S_110121			
		Lab Sample ID:	2401595321				2401595322			
		Sample Date:	11/1/2021				11/1/2021			
	Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC										
	OSW-8260B									
	1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Trichloroethene	79-01-6	ND	1.0	ug/l	---	0.67	1.0	ug/l	J
	Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	OSW-8260BBSim									
	1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

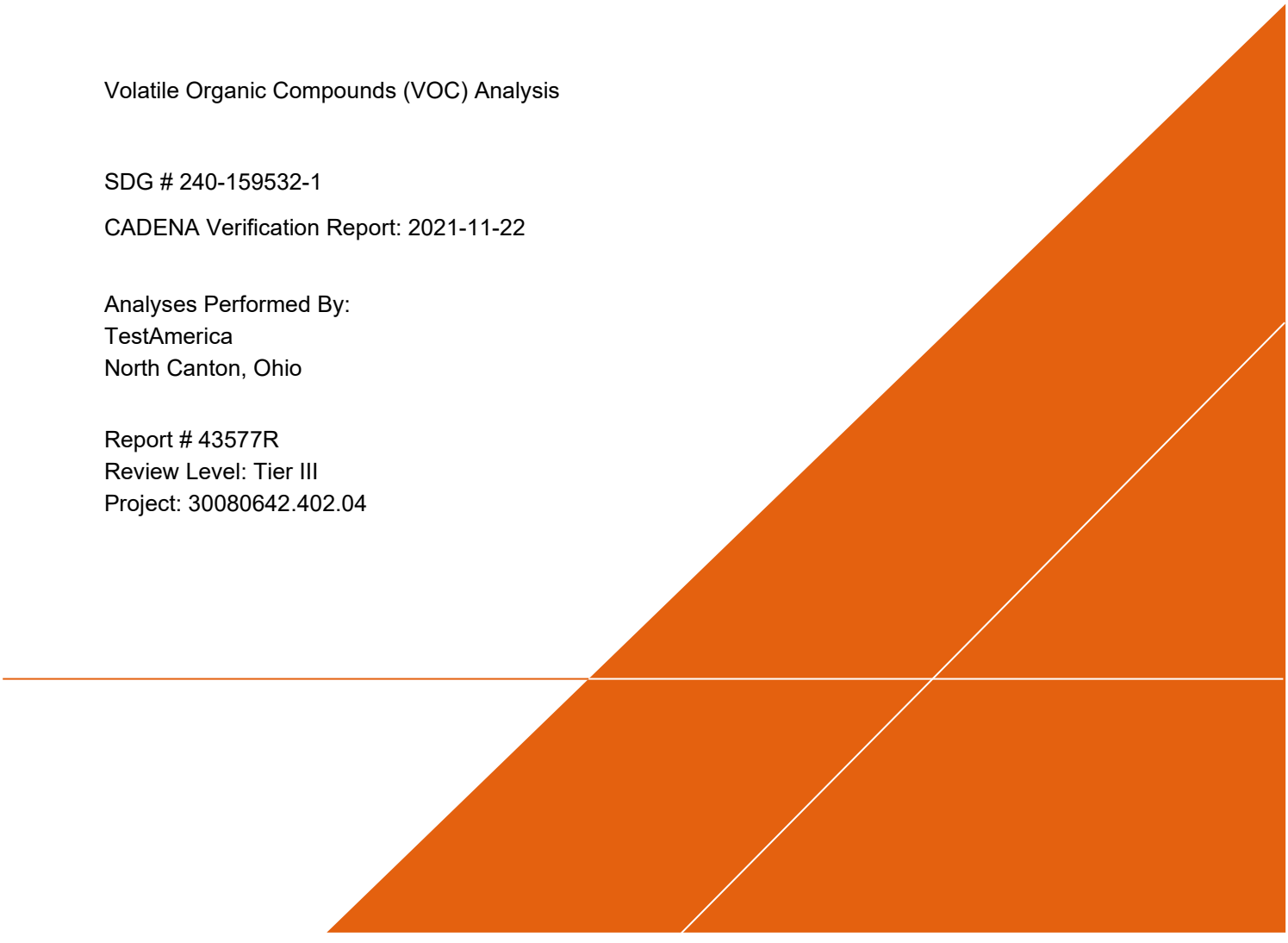
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159532-1

CADENA Verification Report: 2021-11-22

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43577R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159532-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_10	240-159532-1	Water	11/01/21		X	
MW-223S_110121	240-159532-2	Water	11/01/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

DATA REVIEW

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE: 

DATE: December 07, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 8, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: SETH TURNER	TAT if different from below: 10 day; ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_10	---	---		X						1					N	G	X	X	X	X	X	X	(CW)	1 Trip Blank
~~MW-215S_110121~~ CANCELED (CW)	~~11/1/21~~	~~1355~~		~~6~~						~~6~~					~~N~~	~~G~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~3 VOAs for 8260B~~ ~~3 VOAs for 8260B SIM~~
MW-223S_110121	11/1/21	1300		6						6					N	G	X	X	X	X	X	X	X	↓

240-159532 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: ST	ARCADIS	11/1/21 / 1500	Received by: NOVI COLD STORAGE	ARCADIS	11/1/21 / 1500
Relinquished by: [signature]	ARCADIS	11/5/21 / 1435	Received by: [signature]	ETA	11/5/21 1435
Relinquished by: [signature]	ETA	11/5/21 1448	Received in Laboratory by: M. A.	ETA	11/6/21 8:00

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11/22/2021

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159532-1

Client Sample ID: TRIP BLANK_10

Date Collected: 11/01/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159532-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 02:04	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 02:04	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 02:04	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 02:04	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 02:04	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 02:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*		*11/12/21 02:04*	*1*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*		*11/12/21 02:04*	*1*
Toluene-d8 (Surr)	*110*		*78 - 122*		*11/12/21 02:04*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/12/21 02:04*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159532-1

Client Sample ID: MW-223S_110121
Date Collected: 11/01/21 13:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159532-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 19:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*11/12/21 19:40*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 02:26	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 02:26	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 02:26	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 02:26	1
Trichloroethene	**0.67**	**J**	1.0	0.44	ug/L			11/12/21 02:26	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 02:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/12/21 02:26*	*1*
4-Bromofluorobenzene (Surr)	*77*		*56 - 136*		*11/12/21 02:26*	*1*
Toluene-d8 (Surr)	*100*		*78 - 122*		*11/12/21 02:26*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/12/21 02:26*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159540-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/22/2021 10:23:54 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159540-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159540-1

Job ID: 240-159540-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159540-1

Comments
No additional comments.

Receipt
The samples were received on 11/6/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.4º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159540-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159540-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159540-1	TRIP BLANK_35	Water	11/04/21 00:00	11/06/21 08:00
240-159540-2	MW-129S_110421	Water	11/04/21 11:16	11/06/21 08:00
240-159540-3	MW-129_110421	Water	11/04/21 12:06	11/06/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159540-1

Client Sample ID: TRIP BLANK_35 — Lab Sample ID: 240-159540-1

No Detections.

Client Sample ID: MW-129S_110421 — Lab Sample ID: 240-159540-2

No Detections.

Client Sample ID: MW-129_110421 — Lab Sample ID: 240-159540-3

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159540-1

Client Sample ID: TRIP BLANK_35

Date Collected: 11/04/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159540-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/15/21 12:42	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/15/21 12:42	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 12:42	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/15/21 12:42	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 12:42	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/15/21 12:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*122*		*62 - 137*		*11/15/21 12:42*	*1*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*		*11/15/21 12:42*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*11/15/21 12:42*	*1*
Dibromofluoromethane (Surr)	*111*		*73 - 120*		*11/15/21 12:42*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159540-1

Client Sample ID: MW-129S_110421
Date Collected: 11/04/21 11:16
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159540-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 21:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*11/12/21 21:40*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/15/21 13:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/15/21 13:57	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 13:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/15/21 13:57	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 13:57	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/15/21 13:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*113*		*62 - 137*		*11/15/21 13:57*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/15/21 13:57*	*1*
Toluene-d8 (Surr)	*94*		*78 - 122*		*11/15/21 13:57*	*1*
Dibromofluoromethane (Surr)	*107*		*73 - 120*		*11/15/21 13:57*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159540-1

Client Sample ID: MW-129_110421
Date Collected: 11/04/21 12:06
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159540-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 22:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*11/12/21 22:04*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/15/21 14:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/15/21 14:22	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 14:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/15/21 14:22	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 14:22	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/15/21 14:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*62 - 137*		*11/15/21 14:22*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/15/21 14:22*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*11/15/21 14:22*	*1*
Dibromofluoromethane (Surr)	*110*		*73 - 120*		*11/15/21 14:22*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159540-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159540-1	TRIP BLANK_35	122	87	95	111
240-159540-2	MW-129S_110421	113	81	94	107
240-159540-3	MW-129_110421	119	82	95	110
240-159541-H-2 MS	Matrix Spike	104	104	100	106
240-159541-N-2 MSD	Matrix Spike Duplicate	103	101	95	102
LCS 240-512931/5	Lab Control Sample	107	100	96	105
MB 240-512931/7	Method Blank	121	87	95	109

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159540-2	MW-129S_110421	83
240-159540-3	MW-129_110421	82
240-159543-G-3 MS	Matrix Spike	85
240-159543-O-3 MSD	Matrix Spike Duplicate	83
LCS 240-512758/4	Lab Control Sample	83
MB 240-512758/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512931/7
Matrix: Water
Analysis Batch: 512931

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/15/21 12:17	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/15/21 12:17	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 12:17	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/15/21 12:17	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 12:17	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/15/21 12:17	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*121*		*62 - 137*		*11/15/21 12:17*	*1*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*		*11/15/21 12:17*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*11/15/21 12:17*	*1*
Dibromofluoromethane (Surr)	*109*		*73 - 120*		*11/15/21 12:17*	*1*

Lab Sample ID: LCS 240-512931/5
Matrix: Water
Analysis Batch: 512931

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	25.7		ug/L		103	63 - 134
cis-1,2-Dichloroethene	25.0	24.0		ug/L		96	77 - 123
Tetrachloroethene	25.0	29.9		ug/L		120	76 - 123
trans-1,2-Dichloroethene	25.0	25.4		ug/L		101	75 - 124
Trichloroethene	25.0	25.9		ug/L		104	70 - 122
Vinyl chloride	25.0	26.9		ug/L		108	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*107*		*62 - 137*
4-Bromofluorobenzene (Surr)	*100*		*56 - 136*
Toluene-d8 (Surr)	*96*		*78 - 122*
Dibromofluoromethane (Surr)	*105*		*73 - 120*

Lab Sample ID: 240-159541-H-2 MS
Matrix: Water
Analysis Batch: 512931

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	25.0	23.9		ug/L		95	56 - 135
cis-1,2-Dichloroethene	1.0	U	25.0	22.8		ug/L		91	66 - 128
Tetrachloroethene	1.0	U	25.0	30.6		ug/L		122	62 - 131
trans-1,2-Dichloroethene	1.0	U	25.0	22.7		ug/L		91	56 - 136
Trichloroethene	1.0	U	25.0	23.3		ug/L		93	61 - 124
Vinyl chloride	1.0	U	25.0	23.4		ug/L		94	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*104*		*62 - 137*
4-Bromofluorobenzene (Surr)	*104*		*56 - 136*
Toluene-d8 (Surr)	*100*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159541-H-2 MS
Matrix: Water
Analysis Batch: 512931

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*106*		*73 - 120*

Lab Sample ID: 240-159541-N-2 MSD
Matrix: Water
Analysis Batch: 512931

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	25.0	22.9		ug/L		91	56 - 135	4	26
cis-1,2-Dichloroethene	1.0	U	25.0	22.5		ug/L		90	66 - 128	1	14
Tetrachloroethene	1.0	U	25.0	30.4		ug/L		121	62 - 131	1	20
trans-1,2-Dichloroethene	1.0	U	25.0	22.2		ug/L		89	56 - 136	2	15
Trichloroethene	1.0	U	25.0	23.2		ug/L		93	61 - 124	0	15
Vinyl chloride	1.0	U	25.0	22.1		ug/L		88	43 - 157	6	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*
4-Bromofluorobenzene (Surr)	*101*		*56 - 136*
Toluene-d8 (Surr)	*95*		*78 - 122*
Dibromofluoromethane (Surr)	*102*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512758/5
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 16:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/12/21 16:51*	*1*

Lab Sample ID: LCS 240-512758/4
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.63		ug/L		96	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

Lab Sample ID: 240-159543-G-3 MS
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	9.98		ug/L		100	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

Lab Sample ID: 240-159543-O-3 MSD
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.71		ug/L		97	51 - 153	3	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159540-1

GC/MS VOA

Analysis Batch: 512758

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159540-2	MW-129S_110421	Total/NA	Water	8260B SIM	
240-159540-3	MW-129_110421	Total/NA	Water	8260B SIM	
MB 240-512758/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512758/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159543-G-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159543-O-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 512931

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159540-1	TRIP BLANK_35	Total/NA	Water	8260B	
240-159540-2	MW-129S_110421	Total/NA	Water	8260B	
240-159540-3	MW-129_110421	Total/NA	Water	8260B	
MB 240-512931/7	Method Blank	Total/NA	Water	8260B	
LCS 240-512931/5	Lab Control Sample	Total/NA	Water	8260B	
240-159541-H-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159541-N-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159540-1

Client Sample ID: TRIP BLANK_35

Lab Sample ID: 240-159540-1

Date Collected: 11/04/21 00:00

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512931	11/15/21 12:42	SAM	TAL CAN

Client Sample ID: MW-129S_110421

Lab Sample ID: 240-159540-2

Date Collected: 11/04/21 11:16

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512931	11/15/21 13:57	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	512758	11/12/21 21:40	CS	TAL CAN

Client Sample ID: MW-129_110421

Lab Sample ID: 240-159540-3

Date Collected: 11/04/21 12:06

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512931	11/15/21 14:22	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	512758	11/12/21 22:04	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159540-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	
Phone: 248-994-2240	Sampler Name: Allyson Hartz	TAT if different from below: 10 day; 3 weeks / ✓ 2 weeks / 1 week / 2 days / 1 day	
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30080642.402.04	Shipping/Tracking No:		
PO # 30080642.402.04			

COC No: 1 of 1 COCs

For lab use only: Walk-in client; Lab sampling; Job/SDG No:

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_35	—	—		X						1					N	G	X	X	X	X	X	X	X (Fm)	1 Trip Blank
MW-129S_110421	11/4/21	1116		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-129_110421	11/4/21	1206		X						6					N	G	X	X	X	X	X	X	X	↓

240-159540 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; ✓ Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: [signature]	Arcadis	11/4/21 1530	Received by: Novi Cold Storage	Arcadis	11/4/21 1530
Relinquished by: [signature]	ARCADIS	11/5/21 1435	Received by: [signature]	ETA	11/5/21 1435
Relinquished by: [signature]	ETA	11/5/21 1448	Received in Laboratory by: M. L. S.	ETA	11/6/21 8:00

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 159540
Canton Facility

Client ARCADIS Site Name

Cooler unpacked by: Matthew Surma

Cooler Received on 11/6/21 Opened on 11/6/21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.3 °C Corrected Cooler Temp. 0.4 °C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No	(NA) pH Strip Lot# HC157842
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 0104201G	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present?	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.

Sample(s) were received in a broken container.

Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.

Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

DATA VERIFICATION REPORT

November 22, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159540-1
Sample date: 2021-11-04
Report received by CADENA: 2021-11-22
Initial Data Verification completed by CADENA: 2021-11-22
Number of Samples:3
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159540-1

		Sample Name:	TRIP BLANK_35				MW-129S_110421				MW-129_110421			
		Lab Sample ID:	2401595401				2401595402				2401595403			
		Sample Date:	11/4/2021				11/4/2021				11/4/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC													
OSW-8260B													
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim													
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

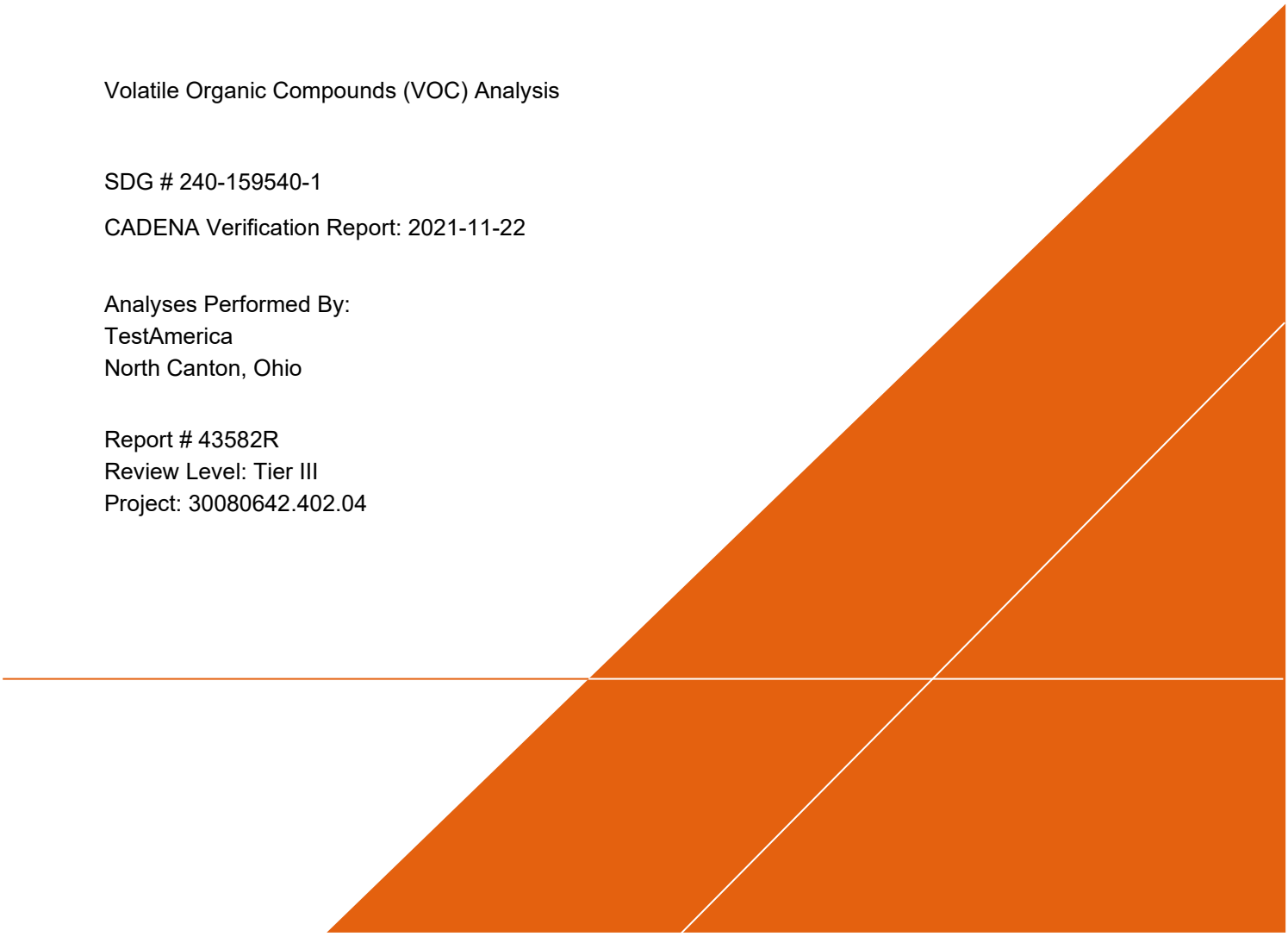
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159540-1

CADENA Verification Report: 2021-11-22

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43582R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159540-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_35	240-159540-1	Water	11/04/21		X	
MW-129S_110421	240-159540-2	Water	11/04/21		X	X
MW-129_110421	240-159540-3	Water	11/04/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE: 

DATE: December 14, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 14, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	DW / NPDES / RCRA / Other	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500		Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377		Sampler Name: Allyson Hartz	TAT if different from below: 10 day; 3 weeks / ✓ 2 weeks / 1 week / 2 days / 1 day		Walk-in client
Phone: 248-994-2240		Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site		Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04					
PO # 30080642.402.04					

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_35	—	—		X						1					N	G	X	X	X	X	X	X	X (Fm)	1 Trip Blank
MW-129S_110421	11/4/21	1116		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-129_110421	11/4/21	1206		X						6					N	G	X	X	X	X	X	X	X	↓

240-159540 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / ✓ Disposal By Lab / Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	11/4/21 1530	Novi Cold Storage	Arcadis	11/4/21 1530
[signature]	ARCADIS	11/5/21 1435	[signature]	ETA	11/5/21 1435
[signature]	ETA	11/5/21 1448	Received in Laboratory by: [signature]	ETA	11/6/21 8:00

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Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159540-1

Client Sample ID: TRIP BLANK_35

Date Collected: 11/04/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159540-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/15/21 12:42	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/15/21 12:42	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 12:42	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/15/21 12:42	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 12:42	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/15/21 12:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*122*		*62 - 137*		*11/15/21 12:42*	*1*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*		*11/15/21 12:42*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*11/15/21 12:42*	*1*
Dibromofluoromethane (Surr)	*111*		*73 - 120*		*11/15/21 12:42*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159540-1

Client Sample ID: MW-129S_110421
Date Collected: 11/04/21 11:16
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159540-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 21:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*11/12/21 21:40*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/15/21 13:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/15/21 13:57	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 13:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/15/21 13:57	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 13:57	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/15/21 13:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*113*		*62 - 137*		*11/15/21 13:57*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/15/21 13:57*	*1*
Toluene-d8 (Surr)	*94*		*78 - 122*		*11/15/21 13:57*	*1*
Dibromofluoromethane (Surr)	*107*		*73 - 120*		*11/15/21 13:57*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159540-1

Client Sample ID: MW-129_110421
Date Collected: 11/04/21 12:06
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159540-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 22:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*11/12/21 22:04*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/15/21 14:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/15/21 14:22	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 14:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/15/21 14:22	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 14:22	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/15/21 14:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*62 - 137*		*11/15/21 14:22*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/15/21 14:22*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*11/15/21 14:22*	*1*
Dibromofluoromethane (Surr)	*110*		*73 - 120*		*11/15/21 14:22*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159533-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/22/2021 9:29:29 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159533-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159533-1

Job ID: 240-159533-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159533-1

Comments
No additional comments.

Receipt
The samples were received on 11/6/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.1º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159533-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159533-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159533-1	TRIP BLANK_25	Water	11/04/21 00:00	11/06/21 08:00
240-159533-2	MW-193S_110421	Water	11/04/21 10:05	11/06/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159533-1

Client Sample ID: TRIP BLANK_25 — Lab Sample ID: 240-159533-1

No Detections.

Client Sample ID: MW-193S_110421 — Lab Sample ID: 240-159533-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159533-1

Client Sample ID: TRIP BLANK_25
Date Collected: 11/04/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159533-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 02:48	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 02:48	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 02:48	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 02:48	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 02:48	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 02:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*11/12/21 02:48*	*1*
4-Bromofluorobenzene (Surr)	*79*		*56 - 136*		*11/12/21 02:48*	*1*
Toluene-d8 (Surr)	*109*		*78 - 122*		*11/12/21 02:48*	*1*
Dibromofluoromethane (Surr)	*97*		*73 - 120*		*11/12/21 02:48*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159533-1

Client Sample ID: MW-193S_110421
Date Collected: 11/04/21 10:05
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159533-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 20:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*11/12/21 20:04*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 03:10	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 03:10	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 03:10	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 03:10	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 03:10	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 03:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/12/21 03:10*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/12/21 03:10*	*1*
Toluene-d8 (Surr)	*115*		*78 - 122*		*11/12/21 03:10*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/12/21 03:10*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159533-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159533-1	TRIP BLANK_25	96	79	109	97
240-159533-2	MW-193S_110421	99	82	115	99
240-159539-B-5 MS	Matrix Spike	96	94	116	97
240-159539-B-5 MSD	Matrix Spike Duplicate	90	87	108	92
LCS 240-512565/4	Lab Control Sample	89	87	107	90
MB 240-512565/6	Method Blank	92	73	102	90

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159533-2	MW-193S_110421	82
240-159543-G-3 MS	Matrix Spike	85
240-159543-O-3 MSD	Matrix Spike Duplicate	83
LCS 240-512758/4	Lab Control Sample	83
MB 240-512758/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512565/6
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 23:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 23:50	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 23:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 23:50	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 23:50	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 23:50	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/11/21 23:50*	*1*
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*11/11/21 23:50*	*1*
Toluene-d8 (Surr)	*102*		*78 - 122*		*11/11/21 23:50*	*1*
Dibromofluoromethane (Surr)	*90*		*73 - 120*		*11/11/21 23:50*	*1*

Lab Sample ID: LCS 240-512565/4
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.4		ug/L		104	63 - 134
cis-1,2-Dichloroethene	10.0	10.1		ug/L		101	77 - 123
Tetrachloroethene	10.0	10.6		ug/L		106	76 - 123
trans-1,2-Dichloroethene	10.0	10.1		ug/L		101	75 - 124
Trichloroethene	10.0	8.95		ug/L		90	70 - 122
Vinyl chloride	10.0	9.56		ug/L		96	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*107*		*78 - 122*
Dibromofluoromethane (Surr)	*90*		*73 - 120*

Lab Sample ID: 240-159539-B-5 MS
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25	U	250	224		ug/L		90	56 - 135
cis-1,2-Dichloroethene	43		250	285		ug/L		97	66 - 128
Tetrachloroethene	25	U	250	201		ug/L		80	62 - 131
trans-1,2-Dichloroethene	86		250	316		ug/L		92	56 - 136
Trichloroethene	830	F1	250	936	F1	ug/L		41	61 - 124
Vinyl chloride	25	U	250	246		ug/L		99	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*
Toluene-d8 (Surr)	*116*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159539-B-5 MS
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*97*		*73 - 120*

Lab Sample ID: 240-159539-B-5 MSD
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	25	U	250	213		ug/L		85	56 - 135	5	26
cis-1,2-Dichloroethene	43		250	272		ug/L		92	66 - 128	5	14
Tetrachloroethene	25	U	250	210		ug/L		84	62 - 131	4	20
trans-1,2-Dichloroethene	86		250	297		ug/L		84	56 - 136	6	15
Trichloroethene	830	F1	250	885	F1	ug/L		21	61 - 124	6	15
Vinyl chloride	25	U	250	233		ug/L		93	43 - 157	6	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*108*		*78 - 122*
Dibromofluoromethane (Surr)	*92*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512758/5
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 16:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/12/21 16:51*	*1*

Lab Sample ID: LCS 240-512758/4
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.63		ug/L		96	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

Lab Sample ID: 240-159543-G-3 MS
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	9.98		ug/L		100	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

Lab Sample ID: 240-159543-O-3 MSD
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.71		ug/L		97	51 - 153	3	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159533-1

GC/MS VOA

Analysis Batch: 512565

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159533-1	TRIP BLANK_25	Total/NA	Water	8260B	
240-159533-2	MW-193S_110421	Total/NA	Water	8260B	
MB 240-512565/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512565/4	Lab Control Sample	Total/NA	Water	8260B	
240-159539-B-5 MS	Matrix Spike	Total/NA	Water	8260B	
240-159539-B-5 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 512758

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159533-2	MW-193S_110421	Total/NA	Water	8260B SIM	
MB 240-512758/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512758/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159543-G-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159543-O-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159533-1

Client Sample ID: TRIP BLANK_25

Lab Sample ID: 240-159533-1

Date Collected: 11/04/21 00:00

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512565	11/12/21 02:48	LEE	TAL CAN

Client Sample ID: MW-193S_110421

Lab Sample ID: 240-159533-2

Date Collected: 11/04/21 10:05

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512565	11/12/21 03:10	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512758	11/12/21 20:04	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159533-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name:	TAT if different from below: 10 day (✓ 2 weeks; 3 weeks; 1 week; 2 days; 1 day)		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM			Sample Specific Notes / Special Instructions:
TRIP BLANK_25	—	—		X						1					N	G	X	X	X	X	X	X	(X)	(X)		1 Trip Blank
MW-193S-110421	1005	11/4/21		X						6					N	G	X	X	X	X	X	X	X			3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159533 Chain of Custody

Possible Hazard Identification
✓ Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Return to Client ✓ Disposal By Lab Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com Cadena #E203631
Level IV Reporting requested

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	11/4/21 / 1500	Novi cold storage	Arcadis	11/4/21 / 1500
Relinquished by: [signature]	Company: ARCADIS	Date/Time: 11/5/21 / 1435	Received by: [signature]	Company: ETA	Date/Time: 11/5/21 1435
Relinquished by: [signature]	Company: ETA	Date/Time: 11/5/21 1446	Received in Laboratory by: [signature]	Company: ETA	Date/Time: 11/6/21 8 00

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11/22/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 159533

Client ARCADIS Site Name

Cooler Received on 11/6/21 Opened on 11/6/21

Cooler unpacked by: Matthew Surma

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 1.0 °C Corrected Cooler Temp. 1.1 °C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2 Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3 Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13 Were all preserved sample(s) at the correct pH upon receipt?	Yes No	(NA) pH Strip Lot# **HC157842**
14 Were VOAs on the COC?	(Yes)	No
15 Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this	Yes	(No) NA
16 Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #0104201G	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present?	Yes	(No)

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.

Sample(s) were received in a broken container.

Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory

Time preserved: Preservative(s) added/Lot number(s).

VOA Sample Preservation - Date/Time VOAs Frozen.

DATA VERIFICATION REPORT

November 22, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159533-1
Sample date: 2021-11-04
Report received by CADENA: 2021-11-22
Initial Data Verification completed by CADENA: 2021-11-22
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

MS/MSD recovery outliers or sample duplicate RPD outliers were not determined using a client sample from this submittal for the test and QC batch noted so qualification was not required based on these sample-specific QC outliers:
GCMS VOC QC batch 512565.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159533-1

		Sample Name:	TRIP BLANK_25				MW-193S_110421			
		Lab Sample ID:	2401595331				2401595332			
		Sample Date:	11/4/2021				11/4/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-160323-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/30/2021 2:46:41 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160323-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
F1	MS and/or MSD recovery exceeds control limits.
F2	MS/MSD RPD exceeds control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-160323-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-160323-1

Comments
No additional comments.

Receipt
The samples were received on 11/18/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.3º C.

GC/MS VOA
Method 8260B: The laboratory control sample (LCS) for analytical batch 240-514748 recovered outside control limits for the following analyte: Trichloroethene. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported: TRIP BLANK_180 (240-160323-1), MW-72_111621 (240-160323-2), MW-72S_111621 (240-160323-3), DUP-08 (240-160323-4), MW-74_111621 (240-160323-5), MW-74S_111621 (240-160323-6) and (LCS 240-514748/4).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160323-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160323-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-160323-1	TRIP BLANK_180	Water	11/16/21 00:00	11/18/21 08:00
240-160323-2	MW-72_111621	Water	11/16/21 11:05	11/18/21 08:00
240-160323-3	MW-72S_111621	Water	11/16/21 13:03	11/18/21 08:00
240-160323-4	DUP-08	Water	11/16/21 00:00	11/18/21 08:00
240-160323-5	MW-74_111621	Water	11/16/21 16:35	11/18/21 08:00
240-160323-6	MW-74S_111621	Water	11/16/21 15:05	11/18/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160323-1

Client Sample ID: TRIP BLANK_180 — Lab Sample ID: 240-160323-1

No Detections.

Client Sample ID: MW-72_111621 — Lab Sample ID: 240-160323-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	1.0		1.0	0.45	ug/L	1		8260B	Total/NA

Client Sample ID: MW-72S_111621 — Lab Sample ID: 240-160323-3

No Detections.

Client Sample ID: DUP-08 — Lab Sample ID: 240-160323-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	1.1		1.0	0.45	ug/L	1		8260B	Total/NA

Client Sample ID: MW-74_111621 — Lab Sample ID: 240-160323-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	1.3	J	2.0	0.86	ug/L	1		8260B SIM	Total/NA
cis-1,2-Dichloroethene	0.71	J	1.0	0.46	ug/L	1		8260B	Total/NA
Vinyl chloride	2.4		1.0	0.45	ug/L	1		8260B	Total/NA

Client Sample ID: MW-74S_111621 — Lab Sample ID: 240-160323-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	1.1		1.0	0.46	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160323-1

Client Sample ID: TRIP BLANK_180
Date Collected: 11/16/21 00:00
Date Received: 11/18/21 08:00

Lab Sample ID: 240-160323-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/27/21 14:58	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/27/21 14:58	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/27/21 14:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/27/21 14:58	1
Trichloroethene	1.0	U *+	1.0	0.44	ug/L			11/27/21 14:58	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/27/21 14:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*62 - 137*		*11/27/21 14:58*	*1*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*		*11/27/21 14:58*	*1*
Toluene-d8 (Surr)	*82*		*78 - 122*		*11/27/21 14:58*	*1*
Dibromofluoromethane (Surr)	*90*		*73 - 120*		*11/27/21 14:58*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160323-1

Client Sample ID: MW-72_111621
Date Collected: 11/16/21 11:05
Date Received: 11/18/21 08:00

Lab Sample ID: 240-160323-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/20/21 03:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*74*		*66 - 120*		*11/20/21 03:03*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/27/21 15:20	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/27/21 15:20	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/27/21 15:20	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/27/21 15:20	1
Trichloroethene	1.0	U *+	1.0	0.44	ug/L			11/27/21 15:20	1
Vinyl chloride	**1.0**		1.0	0.45	ug/L			11/27/21 15:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*		*11/27/21 15:20*	*1*
4-Bromofluorobenzene (Surr)	*101*		*56 - 136*		*11/27/21 15:20*	*1*
Toluene-d8 (Surr)	*87*		*78 - 122*		*11/27/21 15:20*	*1*
Dibromofluoromethane (Surr)	*93*		*73 - 120*		*11/27/21 15:20*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160323-1

Client Sample ID: MW-72S_111621
Date Collected: 11/16/21 13:03
Date Received: 11/18/21 08:00

Lab Sample ID: 240-160323-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/20/21 03:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*74*		*66 - 120*		*11/20/21 03:28*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/27/21 15:43	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/27/21 15:43	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/27/21 15:43	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/27/21 15:43	1
Trichloroethene	1.0	U *+	1.0	0.44	ug/L			11/27/21 15:43	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/27/21 15:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*		*11/27/21 15:43*	*1*
4-Bromofluorobenzene (Surr)	*102*		*56 - 136*		*11/27/21 15:43*	*1*
Toluene-d8 (Surr)	*88*		*78 - 122*		*11/27/21 15:43*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/27/21 15:43*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160323-1

Client Sample ID: DUP-08
Date Collected: 11/16/21 00:00
Date Received: 11/18/21 08:00

Lab Sample ID: 240-160323-4
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/20/21 03:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*		*11/20/21 03:53*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/27/21 16:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/27/21 16:06	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/27/21 16:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/27/21 16:06	1
Trichloroethene	1.0	U *+	1.0	0.44	ug/L			11/27/21 16:06	1
Vinyl chloride	**1.1**		1.0	0.45	ug/L			11/27/21 16:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*62 - 137*		*11/27/21 16:06*	*1*
4-Bromofluorobenzene (Surr)	*97*		*56 - 136*		*11/27/21 16:06*	*1*
Toluene-d8 (Surr)	*84*		*78 - 122*		*11/27/21 16:06*	*1*
Dibromofluoromethane (Surr)	*93*		*73 - 120*		*11/27/21 16:06*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160323-1

Client Sample ID: MW-74_111621
Date Collected: 11/16/21 16:35
Date Received: 11/18/21 08:00

Lab Sample ID: 240-160323-5
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**1.3**	**J**	2.0	0.86	ug/L			11/20/21 04:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*76*		*66 - 120*		*11/20/21 04:17*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/27/21 16:28	1
cis-1,2-Dichloroethene	**0.71**	**J**	1.0	0.46	ug/L			11/27/21 16:28	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/27/21 16:28	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/27/21 16:28	1
Trichloroethene	1.0	U *+	1.0	0.44	ug/L			11/27/21 16:28	1
Vinyl chloride	**2.4**		1.0	0.45	ug/L			11/27/21 16:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*62 - 137*		*11/27/21 16:28*	*1*
4-Bromofluorobenzene (Surr)	*95*		*56 - 136*		*11/27/21 16:28*	*1*
Toluene-d8 (Surr)	*81*		*78 - 122*		*11/27/21 16:28*	*1*
Dibromofluoromethane (Surr)	*89*		*73 - 120*		*11/27/21 16:28*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160323-1

Client Sample ID: MW-74S_111621
Date Collected: 11/16/21 15:05
Date Received: 11/18/21 08:00

Lab Sample ID: 240-160323-6
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/20/21 04:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*		*11/20/21 04:42*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/27/21 16:51	1
cis-1,2-Dichloroethene	**1.1**		1.0	0.46	ug/L			11/27/21 16:51	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/27/21 16:51	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/27/21 16:51	1
Trichloroethene	1.0	U *+	1.0	0.44	ug/L			11/27/21 16:51	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/27/21 16:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*62 - 137*		*11/27/21 16:51*	*1*
4-Bromofluorobenzene (Surr)	*91*		*56 - 136*		*11/27/21 16:51*	*1*
Toluene-d8 (Surr)	*80*		*78 - 122*		*11/27/21 16:51*	*1*
Dibromofluoromethane (Surr)	*87*		*73 - 120*		*11/27/21 16:51*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160323-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-160323-1	TRIP BLANK_180	81	94	82	90
240-160323-2	MW-72_111621	86	101	87	93
240-160323-3	MW-72S_111621	86	102	88	94
240-160323-4	DUP-08	85	97	84	93
240-160323-5	MW-74_111621	80	95	81	89
240-160323-6	MW-74S_111621	77	91	80	87
240-160325-D-3 MS	Matrix Spike	79	95	80	93
240-160325-F-3 MSD	Matrix Spike Duplicate	85	100	85	98
LCS 240-514748/4	Lab Control Sample	84	102	86	97
MB 240-514748/7	Method Blank	82	95	83	89

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-160323-2	MW-72_111621	74
240-160323-3	MW-72S_111621	74
240-160323-4	DUP-08	75
240-160323-5	MW-74_111621	76
240-160323-6	MW-74S_111621	75
240-160325-I-3 MS	Matrix Spike	80
240-160325-M-3 MSD	Matrix Spike Duplicate	75
LCS 240-513930/4	Lab Control Sample	74
MB 240-513930/5	Method Blank	76

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-514748/7
Matrix: Water
Analysis Batch: 514748

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/27/21 13:27	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/27/21 13:27	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/27/21 13:27	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/27/21 13:27	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/27/21 13:27	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/27/21 13:27	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*62 - 137*		*11/27/21 13:27*	*1*
4-Bromofluorobenzene (Surr)	*95*		*56 - 136*		*11/27/21 13:27*	*1*
Toluene-d8 (Surr)	*83*		*78 - 122*		*11/27/21 13:27*	*1*
Dibromofluoromethane (Surr)	*89*		*73 - 120*		*11/27/21 13:27*	*1*

Lab Sample ID: LCS 240-514748/4
Matrix: Water
Analysis Batch: 514748

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	20.0	18.1		ug/L		90	63 - 134
cis-1,2-Dichloroethene	20.0	21.3		ug/L		106	77 - 123
Tetrachloroethene	20.0	22.5		ug/L		112	76 - 123
trans-1,2-Dichloroethene	20.0	19.9		ug/L		100	75 - 124
Trichloroethene	20.0	26.6	*+	ug/L		133	70 - 122
Vinyl chloride	20.0	18.0		ug/L		90	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*62 - 137*
4-Bromofluorobenzene (Surr)	*102*		*56 - 136*
Toluene-d8 (Surr)	*86*		*78 - 122*
Dibromofluoromethane (Surr)	*97*		*73 - 120*

Lab Sample ID: 240-160325-D-3 MS
Matrix: Water
Analysis Batch: 514748

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	20.0	16.2		ug/L		81	56 - 135
cis-1,2-Dichloroethene	1.0	U F2	20.0	18.3		ug/L		92	66 - 128
Tetrachloroethene	1.0	U	20.0	19.2		ug/L		96	62 - 131
trans-1,2-Dichloroethene	1.0	U F2	20.0	17.5		ug/L		88	56 - 136
Trichloroethene	1.0	U F2 F1 *+	20.0	23.5		ug/L		118	61 - 124
Vinyl chloride	1.0	U	20.0	14.0		ug/L		70	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*62 - 137*
4-Bromofluorobenzene (Surr)	*95*		*56 - 136*
Toluene-d8 (Surr)	*80*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-160325-D-3 MS
Matrix: Water
Analysis Batch: 514748

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	*93*		*73 - 120*

Lab Sample ID: 240-160325-F-3 MSD
Matrix: Water
Analysis Batch: 514748

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	20.0	19.4		ug/L		97	56 - 135	18	26
cis-1,2-Dichloroethene	1.0	U F2	20.0	21.9	F2	ug/L		110	66 - 128	18	14
Tetrachloroethene	1.0	U	20.0	23.1		ug/L		116	62 - 131	19	20
trans-1,2-Dichloroethene	1.0	U F2	20.0	21.4	F2	ug/L		107	56 - 136	20	15
Trichloroethene	1.0	U F2 F1 * +	20.0	27.9	F1 F2	ug/L		140	61 - 124	17	15
Vinyl chloride	1.0	U	20.0	17.5		ug/L		88	43 - 157	22	24

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*85*		*62 - 137*
4-Bromofluorobenzene (Surr)	*100*		*56 - 136*
Toluene-d8 (Surr)	*85*		*78 - 122*
Dibromofluoromethane (Surr)	*98*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513930/5
Matrix: Water
Analysis Batch: 513930

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/19/21 18:46	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*76*		*66 - 120*		*11/19/21 18:46*	*1*

Lab Sample ID: LCS 240-513930/4
Matrix: Water
Analysis Batch: 513930

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.6		ug/L		106	80 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*74*		*66 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-160325-I-3 MS
Matrix: Water
Analysis Batch: 513930

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	1.4	J F1	10.0	11.4		ug/L		101	51 - 153		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*80*		*66 - 120*

Lab Sample ID: 240-160325-M-3 MSD
Matrix: Water
Analysis Batch: 513930

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	1.4	J F1	10.0	11.0		ug/L		96	51 - 153	4	16

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160323-1

GC/MS VOA

Analysis Batch: 513930

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-160323-2	MW-72_111621	Total/NA	Water	8260B SIM	
240-160323-3	MW-72S_111621	Total/NA	Water	8260B SIM	
240-160323-4	DUP-08	Total/NA	Water	8260B SIM	
240-160323-5	MW-74_111621	Total/NA	Water	8260B SIM	
240-160323-6	MW-74S_111621	Total/NA	Water	8260B SIM	
MB 240-513930/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513930/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-160325-I-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-160325-M-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 514748

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-160323-1	TRIP BLANK_180	Total/NA	Water	8260B	
240-160323-2	MW-72_111621	Total/NA	Water	8260B	
240-160323-3	MW-72S_111621	Total/NA	Water	8260B	
240-160323-4	DUP-08	Total/NA	Water	8260B	
240-160323-5	MW-74_111621	Total/NA	Water	8260B	
240-160323-6	MW-74S_111621	Total/NA	Water	8260B	
MB 240-514748/7	Method Blank	Total/NA	Water	8260B	
LCS 240-514748/4	Lab Control Sample	Total/NA	Water	8260B	
240-160325-D-3 MS	Matrix Spike	Total/NA	Water	8260B	
240-160325-F-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160323-1

Client Sample ID: TRIP BLANK_180
Lab Sample ID: 240-160323-1
Date Collected: 11/16/21 00:00
Matrix: Water
Date Received: 11/18/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	514748	11/27/21 14:58	HMB	TAL CAN

Client Sample ID: MW-72_111621
Lab Sample ID: 240-160323-2
Date Collected: 11/16/21 11:05
Matrix: Water
Date Received: 11/18/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	514748	11/27/21 15:20	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		1	513930	11/20/21 03:03	CS	TAL CAN

Client Sample ID: MW-72S_111621
Lab Sample ID: 240-160323-3
Date Collected: 11/16/21 13:03
Matrix: Water
Date Received: 11/18/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	514748	11/27/21 15:43	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		1	513930	11/20/21 03:28	CS	TAL CAN

Client Sample ID: DUP-08
Lab Sample ID: 240-160323-4
Date Collected: 11/16/21 00:00
Matrix: Water
Date Received: 11/18/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	514748	11/27/21 16:06	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		1	513930	11/20/21 03:53	CS	TAL CAN

Client Sample ID: MW-74_111621
Lab Sample ID: 240-160323-5
Date Collected: 11/16/21 16:35
Matrix: Water
Date Received: 11/18/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	514748	11/27/21 16:28	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		1	513930	11/20/21 04:17	CS	TAL CAN

Client Sample ID: MW-74S_111621
Lab Sample ID: 240-160323-6
Date Collected: 11/16/21 15:05
Matrix: Water
Date Received: 11/18/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	514748	11/27/21 16:51	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		1	513930	11/20/21 04:42	CS	TAL CAN

Laboratory References:
TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160323-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: SH Samantha Hindle / COURIER: CHRISTINA WEAVER		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30080642.402.04	Shipping/Tracking No:		
PO # 30080642.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below: 10 day; 3 weeks; 2 weeks; 1 week; 2 days; 1 day

Analyses

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_180	—	—		X						1					N	G	X	X	X	X	X	X	~~X~~ (W)	1 Trip Blank
MW-72_111621	11/16/21	11:05		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-72S_111621	11/16/21	13:03		6						6					N	G	X	X	X	X	X	X	X	
DUP-08	11/16/21	—		6						6					N	G	X	X	X	X	X	X	X	
MW-74_111621	11/16/21	16:35		6						6					N	G	X	X	X	X	X	X	X	
MW-74S_111621	11/16/21	15:05		6						6					N	G	X	X	X	X	X	X	X	

240-160323 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
SH [signature]	Arcadis	11/16/21 17:50	Non cold storage	Arcadis	11/16/21 17:50
[signature]	ARCADIS	11/17/21 / 1029	[signature]	ETA	11/17/21
[signature]	ETA	11/17/21	Received in Laboratory by: [signature]	TA	11-18-21 0800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 160373**
Canton Facility

Client Arcadis Site Name

Cooler Received on 11-18-21 Opened on 11-18-21

Cooler unpacked by: Brandon

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # NA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.2 °C Corrected Cooler Temp. 0.3 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC157842
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ____	Yes	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

No SIM on TB per corrected COC

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

November 30, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 160323-1
Sample date: 2021-11-16
Report received by CADENA: 2021-11-30
Initial Data Verification completed by CADENA: 2021-11-30
Number of Samples:6
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 514748 LCS recovery was outlying biased high for the following analyte: TRICHLOROETHENE. Associated client sample results were non-detect so qualification was not required based on this high bias QC outlier.

GCMS VOC QC batch MS/MSD recovery outliers were not determined using a client sample so qualification was not required based on these sample-specific QC outliers.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 160323-1

	Sample Name:	TRIP BLANK_180				MW-72_111621				MW-72S_111621				DUP-08				MW-74_111621				MW-74S_111621			
	Lab Sample ID:	2401603231				2401603232				2401603233				2401603234				2401603235				2401603236			
	Sample Date:	11/16/2021				11/16/2021				11/16/2021				11/16/2021				11/16/2021				11/16/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC																									
OSW-8260B																									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	0.71	1.0	ug/l	J	1.1	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	1.0	1.0	ug/l	---	ND	1.0	ug/l	---	1.1	1.0	ug/l	---	2.4	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim																									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---	ND	2.0	ug/l	---	1.3	2.0	ug/l	J	ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

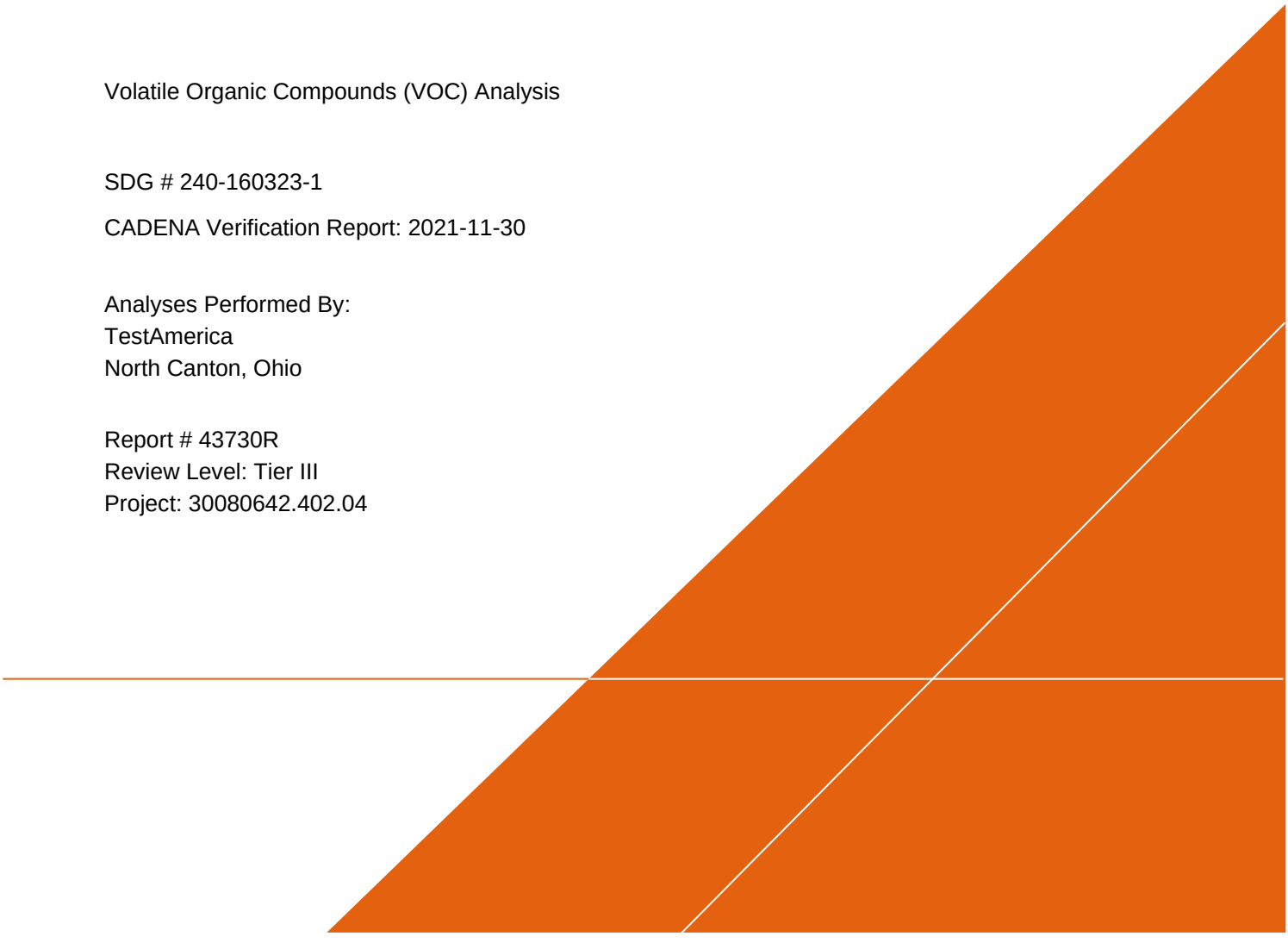
Volatile Organic Compounds (VOC) Analysis

SDG # 240-160323-1

CADENA Verification Report: 2021-11-30

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43730R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-160323-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_180	240-160323-1	Water	11/16/21		X	
MW-72_111621	240-160323-2	Water	11/16/21		X	X
MW-72S_111621	240-160323-3	Water	11/16/21		X	X
DUP-08	240-160323-4	Water	11/16/21	MW-72_111621	X	X
MW-74_111621	240-160323-5	Water	11/16/21		X	X
MW-74S_111621	240-160323-6	Water	11/16/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Compound	Criteria
TRIP BLANK_180 MW-72_111621 MW-72S_111621 DUP-08 MW-74_111621 MW-74S_111621	Continuous Calibration Verification %D	Trichloroethene	+35.6%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R

DATA REVIEW

Initial/Continuing	Criteria	Sample Result	Qualification
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result (µg/L)	Duplicate Result (µg/L)	RPD
MW-72_111621 / DUP-08	Vinyl chloride	1.0	1.1	AC

Notes:

AC – Acceptable

The calculated differences between the parent sample and field duplicate were acceptable.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

DATA REVIEW

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: SH Samantha Hinkle / COURIER: CHRISTINA WEAVER		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30080642.402.04	Shipping/Tracking No:		
PO # 30080642.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below: 10 day; 3 weeks; ✓ 2 weeks; 1 week; 2 days; 1 day

Analyses

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_180	—	—		X						1					N	G	X	X	X	X	X	X	~~X~~ (W)	1 Trip Blank
MW-72_111621	11/16/21	11:05		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-72S_111621	11/16/21	13:03		6						6					N	G	X	X	X	X	X	X	X	
DUP-08	11/16/21	—		6						6					N	G	X	X	X	X	X	X	X	
MW-74_111621	11/16/21	16:35		6						6					N	G	X	X	X	X	X	X	X	
MW-74S_111621	11/16/21	15:05		6						6					N	G	X	X	X	X	X	X	X	

240-160323 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ✓ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
SH [signature]	Arcadis	11/16/21 17:50	Non cold storage	Arcadis	11/16/21 17:50
[signature]	ARCADIS	11/17/21 / 1029	[signature]	ETA	11/17/21
[signature]	ETA	11/17/21	Received in Laboratory by: [signature]	TA	11-18-21 0800

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Client Sample ID: TRIP BLANK_180

Lab Sample ID: 240-160323-1

Date Collected: 11/16/21 00:00
Matrix: Water
Date Received: 11/18/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/27/21 14:58	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/27/21 14:58	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/27/21 14:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/27/21 14:58	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/27/21 14:58	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/27/21 14:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*62 - 137*		*11/27/21 14:58*	*1*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*		*11/27/21 14:58*	*1*
Toluene-d8 (Surr)	*82*		*78 - 122*		*11/27/21 14:58*	*1*
Dibromofluoromethane (Surr)	*90*		*73 - 120*		*11/27/21 14:58*	*1*

Client Sample ID: MW-72_111621

Lab Sample ID: 240-160323-2

Date Collected: 11/16/21 11:05
Matrix: Water
Date Received: 11/18/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/20/21 03:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*74*		*66 - 120*		*11/20/21 03:03*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/27/21 15:20	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/27/21 15:20	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/27/21 15:20	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/27/21 15:20	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/27/21 15:20	1
Vinyl chloride	**1.0**		1.0	0.45	ug/L			11/27/21 15:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*		*11/27/21 15:20*	*1*
4-Bromofluorobenzene (Surr)	*101*		*56 - 136*		*11/27/21 15:20*	*1*
Toluene-d8 (Surr)	*87*		*78 - 122*		*11/27/21 15:20*	*1*
Dibromofluoromethane (Surr)	*93*		*73 - 120*		*11/27/21 15:20*	*1*

Client Sample ID: MW-72S_111621

Lab Sample ID: 240-160323-3

Date Collected: 11/16/21 13:03
Matrix: Water
Date Received: 11/18/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/20/21 03:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*74*		*66 - 120*		*11/20/21 03:28*	*1*

Client Sample ID: MW-72S_111621

Lab Sample ID: 240-160323-3

Date Collected: 11/16/21 13:03
Matrix: Water
Date Received: 11/18/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/27/21 15:43	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/27/21 15:43	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/27/21 15:43	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/27/21 15:43	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/27/21 15:43	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/27/21 15:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*		*11/27/21 15:43*	*1*
4-Bromofluorobenzene (Surr)	*102*		*56 - 136*		*11/27/21 15:43*	*1*
Toluene-d8 (Surr)	*88*		*78 - 122*		*11/27/21 15:43*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/27/21 15:43*	*1*

Client Sample ID: DUP-08

Lab Sample ID: 240-160323-4

Date Collected: 11/16/21 00:00
Matrix: Water
Date Received: 11/18/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/20/21 03:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*		*11/20/21 03:53*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/27/21 16:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/27/21 16:06	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/27/21 16:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/27/21 16:06	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/27/21 16:06	1
Vinyl chloride	**1.1**		1.0	0.45	ug/L			11/27/21 16:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*62 - 137*		*11/27/21 16:06*	*1*
4-Bromofluorobenzene (Surr)	*97*		*56 - 136*		*11/27/21 16:06*	*1*
Toluene-d8 (Surr)	*84*		*78 - 122*		*11/27/21 16:06*	*1*
Dibromofluoromethane (Surr)	*93*		*73 - 120*		*11/27/21 16:06*	*1*

Client Sample ID: MW-74_111621

Lab Sample ID: 240-160323-5

Date Collected: 11/16/21 16:35
Matrix: Water
Date Received: 11/18/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**1.3**	**J**	2.0	0.86	ug/L			11/20/21 04:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*76*		*66 - 120*		*11/20/21 04:17*	*1*

Client Sample ID: MW-74_111621
Lab Sample ID: 240-160323-5

Date Collected: 11/16/21 16:35
Matrix: Water
Date Received: 11/18/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/27/21 16:28	1
cis-1,2-Dichloroethene	**0.71**	**J**	1.0	0.46	ug/L			11/27/21 16:28	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/27/21 16:28	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/27/21 16:28	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/27/21 16:28	1
Vinyl chloride	**2.4**		1.0	0.45	ug/L			11/27/21 16:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*62 - 137*		*11/27/21 16:28*	*1*
4-Bromofluorobenzene (Surr)	*95*		*56 - 136*		*11/27/21 16:28*	*1*
Toluene-d8 (Surr)	*81*		*78 - 122*		*11/27/21 16:28*	*1*
Dibromofluoromethane (Surr)	*89*		*73 - 120*		*11/27/21 16:28*	*1*

Client Sample ID: MW-74S_111621
Lab Sample ID: 240-160323-6

Date Collected: 11/16/21 15:05
Matrix: Water
Date Received: 11/18/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/20/21 04:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*		*11/20/21 04:42*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/27/21 16:51	1
cis-1,2-Dichloroethene	**1.1**		1.0	0.46	ug/L			11/27/21 16:51	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/27/21 16:51	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/27/21 16:51	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/27/21 16:51	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/27/21 16:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*62 - 137*		*11/27/21 16:51*	*1*
4-Bromofluorobenzene (Surr)	*91*		*56 - 136*		*11/27/21 16:51*	*1*
Toluene-d8 (Surr)	*80*		*78 - 122*		*11/27/21 16:51*	*1*
Dibromofluoromethane (Surr)	*87*		*73 - 120*		*11/27/21 16:51*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-160447-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
12/7/2021 7:35:37 AM

Michael DelMonico, Project Manager I
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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160447-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
E	Result exceeded calibration range.
F1	MS and/or MSD recovery exceeds control limits.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-160447-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-160447-1

Comments
No additional comments.

Receipt
The samples were received on 11/19/2021 9:50 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.3º C.

GC/MS VOA
Method 8260B: The laboratory control sample (LCS) for analytical batch 240-514886 recovered outside control limits for the following analyte: Trichloroethene. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported: TRIP BLANK_177 (240-160447-1), MW-73D_111721 (240-160447-2), MW-73SR_111721 (240-160447-3) and (LCS 240-514886/4).

Method 8260B: The laboratory control sample (LCS) for analytical batch 240-514992 recovered outside control limits for the following analyte: Trichloroethene. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported: DUP-10 (240-160447-4), MW-75D_111721 (240-160447-5) and (LCS 240-514992/5).

Method 8260B SIM: The matrix spike/matrix spike duplicate (MS/MSD) for analytical batch 240-514345 is not reported due to analyst error during prep.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160447-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160447-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-160447-1	TRIP BLANK_177	Water	11/17/21 00:00	11/19/21 09:50
240-160447-2	MW-73D_111721	Water	11/17/21 11:20	11/19/21 09:50
240-160447-3	MW-73SR_111721	Water	11/17/21 12:40	11/19/21 09:50
240-160447-4	DUP-10	Water	11/17/21 00:00	11/19/21 09:50
240-160447-5	MW-75D_111721	Water	11/17/21 15:10	11/19/21 09:50

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160447-1

Client Sample ID: TRIP BLANK_177 — Lab Sample ID: 240-160447-1

No Detections.

Client Sample ID: MW-73D_111721 — Lab Sample ID: 240-160447-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	4.1		2.0	0.86	ug/L	1		8260B SIM	Total/NA

Client Sample ID: MW-73SR_111721 — Lab Sample ID: 240-160447-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	2.4		1.0	0.46	ug/L	1		8260B	Total/NA

Client Sample ID: DUP-10 — Lab Sample ID: 240-160447-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	2.9		2.0	0.86	ug/L	1		8260B SIM	Total/NA

Client Sample ID: MW-75D_111721 — Lab Sample ID: 240-160447-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	2.2		2.0	0.86	ug/L	1		8260B SIM	Total/NA
Vinyl chloride	2.4		1.0	0.45	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160447-1

Client Sample ID: TRIP BLANK_177
Date Collected: 11/17/21 00:00
Date Received: 11/19/21 09:50

Lab Sample ID: 240-160447-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/29/21 17:00	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/29/21 17:00	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/29/21 17:00	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/29/21 17:00	1
Trichloroethene	1.0	U *+	1.0	0.44	ug/L			11/29/21 17:00	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/29/21 17:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*62 - 137*		*11/29/21 17:00*	*1*
4-Bromofluorobenzene (Surr)	*97*		*56 - 136*		*11/29/21 17:00*	*1*
Toluene-d8 (Surr)	*82*		*78 - 122*		*11/29/21 17:00*	*1*
Dibromofluoromethane (Surr)	*90*		*73 - 120*		*11/29/21 17:00*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160447-1

Client Sample ID: MW-73D_111721
Date Collected: 11/17/21 11:20
Date Received: 11/19/21 09:50

Lab Sample ID: 240-160447-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	4.1		2.0	0.86	ug/L			11/23/21 23:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*71*		*66 - 120*		*11/23/21 23:25*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/29/21 17:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/29/21 17:22	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/29/21 17:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/29/21 17:22	1
Trichloroethene	1.0	U *+	1.0	0.44	ug/L			11/29/21 17:22	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/29/21 17:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*62 - 137*		*11/29/21 17:22*	*1*
4-Bromofluorobenzene (Surr)	*98*		*56 - 136*		*11/29/21 17:22*	*1*
Toluene-d8 (Surr)	*84*		*78 - 122*		*11/29/21 17:22*	*1*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*11/29/21 17:22*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160447-1

Client Sample ID: MW-73SR_111721
Date Collected: 11/17/21 12:40
Date Received: 11/19/21 09:50

Lab Sample ID: 240-160447-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/23/21 23:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*72*		*66 - 120*		*11/23/21 23:50*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/29/21 17:45	1
cis-1,2-Dichloroethene	**2.4**		1.0	0.46	ug/L			11/29/21 17:45	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/29/21 17:45	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/29/21 17:45	1
Trichloroethene	1.0	U *+	1.0	0.44	ug/L			11/29/21 17:45	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/29/21 17:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*62 - 137*		*11/29/21 17:45*	*1*
4-Bromofluorobenzene (Surr)	*95*		*56 - 136*		*11/29/21 17:45*	*1*
Toluene-d8 (Surr)	*82*		*78 - 122*		*11/29/21 17:45*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*11/29/21 17:45*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160447-1

Client Sample ID: DUP-10
Date Collected: 11/17/21 00:00
Date Received: 11/19/21 09:50

Lab Sample ID: 240-160447-4
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.9		2.0	0.86	ug/L			11/24/21 00:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*73*		*66 - 120*		*11/24/21 00:15*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/30/21 14:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/30/21 14:57	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/30/21 14:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/30/21 14:57	1
Trichloroethene	1.0	U *+	1.0	0.44	ug/L			11/30/21 14:57	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/30/21 14:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*		*11/30/21 14:57*	*1*
4-Bromofluorobenzene (Surr)	*92*		*56 - 136*		*11/30/21 14:57*	*1*
Toluene-d8 (Surr)	*84*		*78 - 122*		*11/30/21 14:57*	*1*
Dibromofluoromethane (Surr)	*85*		*73 - 120*		*11/30/21 14:57*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160447-1

Client Sample ID: MW-75D_111721
Date Collected: 11/17/21 15:10
Date Received: 11/19/21 09:50

Lab Sample ID: 240-160447-5
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**2.2**		2.0	0.86	ug/L			11/24/21 00:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*		*11/24/21 00:40*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/30/21 15:20	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/30/21 15:20	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/30/21 15:20	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/30/21 15:20	1
Trichloroethene	1.0	U *+	1.0	0.44	ug/L			11/30/21 15:20	1
Vinyl chloride	**2.4**		1.0	0.45	ug/L			11/30/21 15:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*62 - 137*		*11/30/21 15:20*	*1*
4-Bromofluorobenzene (Surr)	*96*		*56 - 136*		*11/30/21 15:20*	*1*
Toluene-d8 (Surr)	*87*		*78 - 122*		*11/30/21 15:20*	*1*
Dibromofluoromethane (Surr)	*86*		*73 - 120*		*11/30/21 15:20*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160447-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-160447-1	TRIP BLANK_177	84	97	82	90
240-160447-2	MW-73D_111721	81	98	84	91
240-160447-3	MW-73SR_111721	82	95	82	92
240-160447-4	DUP-10	86	92	84	85
240-160447-5	MW-75D_111721	87	96	87	86
240-160449-B-4 MS	Matrix Spike	81	100	82	96
240-160449-B-4 MSD	Matrix Spike Duplicate	80	98	82	97
240-160449-E-4 MS	Matrix Spike	88	99	87	90
240-160449-E-4 MSD	Matrix Spike Duplicate	85	95	83	90
LCS 240-514886/4	Lab Control Sample	80	99	82	95
LCS 240-514992/5	Lab Control Sample	89	101	89	94
MB 240-514886/7	Method Blank	77	91	78	84
MB 240-514992/8	Method Blank	88	96	86	87

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-160447-2	MW-73D_111721	71
240-160447-3	MW-73SR_111721	72
240-160447-4	DUP-10	73
240-160447-5	MW-75D_111721	77
LCS 240-514345/4	Lab Control Sample	75
MB 240-514345/5	Method Blank	76

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-514886/7
Matrix: Water
Analysis Batch: 514886

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/29/21 15:16	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/29/21 15:16	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/29/21 15:16	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/29/21 15:16	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/29/21 15:16	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/29/21 15:16	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*62 - 137*		*11/29/21 15:16*	*1*
4-Bromofluorobenzene (Surr)	*91*		*56 - 136*		*11/29/21 15:16*	*1*
Toluene-d8 (Surr)	*78*		*78 - 122*		*11/29/21 15:16*	*1*
Dibromofluoromethane (Surr)	*84*		*73 - 120*		*11/29/21 15:16*	*1*

Lab Sample ID: LCS 240-514886/4
Matrix: Water
Analysis Batch: 514886

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	20.0	19.1		ug/L		96	63 - 134
cis-1,2-Dichloroethene	20.0	22.3		ug/L		111	77 - 123
Tetrachloroethene	20.0	23.1		ug/L		116	76 - 123
trans-1,2-Dichloroethene	20.0	21.4		ug/L		107	75 - 124
Trichloroethene	20.0	27.9	*+	ug/L		140	70 - 122
Vinyl chloride	20.0	19.4		ug/L		97	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*80*		*62 - 137*
4-Bromofluorobenzene (Surr)	*99*		*56 - 136*
Toluene-d8 (Surr)	*82*		*78 - 122*
Dibromofluoromethane (Surr)	*95*		*73 - 120*

Lab Sample ID: 240-160449-B-4 MS
Matrix: Water
Analysis Batch: 514886

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	50	U	1000	827		ug/L		83	56 - 135
cis-1,2-Dichloroethene	100		1000	1090		ug/L		99	66 - 128
Tetrachloroethene	50	U	1000	981		ug/L		98	62 - 131
trans-1,2-Dichloroethene	50	U	1000	913		ug/L		91	56 - 136
Trichloroethene	50	U F1 *+	1000	1230		ug/L		123	61 - 124
Vinyl chloride	200		1000	963		ug/L		76	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*81*		*62 - 137*
4-Bromofluorobenzene (Surr)	*100*		*56 - 136*
Toluene-d8 (Surr)	*82*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-160449-B-4 MS
Matrix: Water
Analysis Batch: 514886

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	96		73 - 120

Lab Sample ID: 240-160449-B-4 MSD
Matrix: Water
Analysis Batch: 514886

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	50	U	1000	879		ug/L		88	56 - 135	6	26
cis-1,2-Dichloroethene	100		1000	1170		ug/L		107	66 - 128	8	14
Tetrachloroethene	50	U	1000	1010		ug/L		101	62 - 131	3	20
trans-1,2-Dichloroethene	50	U	1000	1010		ug/L		101	56 - 136	10	15
Trichloroethene	50	U F1 *+	1000	1310	F1	ug/L		131	61 - 124	7	15
Vinyl chloride	200		1000	1040		ug/L		84	43 - 157	8	24

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	80		62 - 137
4-Bromofluorobenzene (Surr)	98		56 - 136
Toluene-d8 (Surr)	82		78 - 122
Dibromofluoromethane (Surr)	97		73 - 120

Lab Sample ID: MB 240-514992/8
Matrix: Water
Analysis Batch: 514992

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/30/21 12:45	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/30/21 12:45	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/30/21 12:45	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/30/21 12:45	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/30/21 12:45	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/30/21 12:45	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	88		62 - 137		11/30/21 12:45	1
4-Bromofluorobenzene (Surr)	96		56 - 136		11/30/21 12:45	1
Toluene-d8 (Surr)	86		78 - 122		11/30/21 12:45	1
Dibromofluoromethane (Surr)	87		73 - 120		11/30/21 12:45	1

Lab Sample ID: LCS 240-514992/5
Matrix: Water
Analysis Batch: 514992

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	20.0	21.8		ug/L		109	63 - 134
cis-1,2-Dichloroethene	20.0	23.0		ug/L		115	77 - 123
Tetrachloroethene	20.0	21.5		ug/L		108	76 - 123
trans-1,2-Dichloroethene	20.0	23.9		ug/L		119	75 - 124
Trichloroethene	20.0	27.0	*+	ug/L		135	70 - 122

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-514992/5
Matrix: Water
Analysis Batch: 514992

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Vinyl chloride			20.0	22.6		ug/L		113	60 - 144		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*62 - 137*
4-Bromofluorobenzene (Surr)	*101*		*56 - 136*
Toluene-d8 (Surr)	*89*		*78 - 122*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: 240-160449-E-4 MS
Matrix: Water
Analysis Batch: 514992

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,1-Dichloroethene	5.0	U	100	96.4		ug/L		96	56 - 135		
cis-1,2-Dichloroethene	87		100	186		ug/L		99	66 - 128		
Tetrachloroethene	5.0	U	100	90.9		ug/L		91	62 - 131		
trans-1,2-Dichloroethene	5.0	U	100	106		ug/L		106	56 - 136		
Trichloroethene	5.0	U *+	100	117		ug/L		117	61 - 124		
Vinyl chloride	250		100	334	E	ug/L		87	43 - 157		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*62 - 137*
4-Bromofluorobenzene (Surr)	*99*		*56 - 136*
Toluene-d8 (Surr)	*87*		*78 - 122*
Dibromofluoromethane (Surr)	*90*		*73 - 120*

Lab Sample ID: 240-160449-E-4 MSD
Matrix: Water
Analysis Batch: 514992

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	5.0	U	100	100		ug/L		100	56 - 135	4	26
cis-1,2-Dichloroethene	87		100	185		ug/L		99	66 - 128	0	14
Tetrachloroethene	5.0	U	100	91.7		ug/L		92	62 - 131	1	20
trans-1,2-Dichloroethene	5.0	U	100	109		ug/L		109	56 - 136	3	15
Trichloroethene	5.0	U *+	100	120		ug/L		120	61 - 124	2	15
Vinyl chloride	250		100	324	E	ug/L		76	43 - 157	3	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*62 - 137*
4-Bromofluorobenzene (Surr)	*95*		*56 - 136*
Toluene-d8 (Surr)	*83*		*78 - 122*
Dibromofluoromethane (Surr)	*90*		*73 - 120*

QC Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160447-1

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-514345/5
Matrix: Water
Analysis Batch: 514345

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/23/21 15:10	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*76*		*66 - 120*		*11/23/21 15:10*	*1*

Lab Sample ID: LCS 240-514345/4
Matrix: Water
Analysis Batch: 514345

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.2		ug/L		102	80 - 122		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160447-1

GC/MS VOA

Analysis Batch: 514345

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-160447-2	MW-73D_111721	Total/NA	Water	8260B SIM	
240-160447-3	MW-73SR_111721	Total/NA	Water	8260B SIM	
240-160447-4	DUP-10	Total/NA	Water	8260B SIM	
240-160447-5	MW-75D_111721	Total/NA	Water	8260B SIM	
MB 240-514345/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-514345/4	Lab Control Sample	Total/NA	Water	8260B SIM	

Analysis Batch: 514886

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-160447-1	TRIP BLANK_177	Total/NA	Water	8260B	
240-160447-2	MW-73D_111721	Total/NA	Water	8260B	
240-160447-3	MW-73SR_111721	Total/NA	Water	8260B	
MB 240-514886/7	Method Blank	Total/NA	Water	8260B	
LCS 240-514886/4	Lab Control Sample	Total/NA	Water	8260B	
240-160449-B-4 MS	Matrix Spike	Total/NA	Water	8260B	
240-160449-B-4 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 514992

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-160447-4	DUP-10	Total/NA	Water	8260B	
240-160447-5	MW-75D_111721	Total/NA	Water	8260B	
MB 240-514992/8	Method Blank	Total/NA	Water	8260B	
LCS 240-514992/5	Lab Control Sample	Total/NA	Water	8260B	
240-160449-E-4 MS	Matrix Spike	Total/NA	Water	8260B	
240-160449-E-4 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160447-1

Client Sample ID: TRIP BLANK_177
Lab Sample ID: 240-160447-1
Date Collected: 11/17/21 00:00
Matrix: Water
Date Received: 11/19/21 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	514886	11/29/21 17:00	HMB	TAL CAN

Client Sample ID: MW-73D_111721
Lab Sample ID: 240-160447-2
Date Collected: 11/17/21 11:20
Matrix: Water
Date Received: 11/19/21 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	514886	11/29/21 17:22	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		1	514345	11/23/21 23:25	CS	TAL CAN

Client Sample ID: MW-73SR_111721
Lab Sample ID: 240-160447-3
Date Collected: 11/17/21 12:40
Matrix: Water
Date Received: 11/19/21 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	514886	11/29/21 17:45	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		1	514345	11/23/21 23:50	CS	TAL CAN

Client Sample ID: DUP-10
Lab Sample ID: 240-160447-4
Date Collected: 11/17/21 00:00
Matrix: Water
Date Received: 11/19/21 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	514992	11/30/21 14:57	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		1	514345	11/24/21 00:15	CS	TAL CAN

Client Sample ID: MW-75D_111721
Lab Sample ID: 240-160447-5
Date Collected: 11/17/21 15:10
Matrix: Water
Date Received: 11/19/21 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	514992	11/30/21 15:20	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		1	514345	11/24/21 00:40	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160447-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

1.2/13

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: SAMANTHA HINDLE	TAT if different from below: ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client
Phone: 248-994-2240	COURIER: CHRISTINA WEAVER	10 day		Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30080642.402.04	Shipping/Tracking No:			
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn/Ac/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_177	—	—		X						1					N	G	X	X	X	X	X	X		1 Trip Blank
MW-73D_111721	11/17/21	1120		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-73SR_111721	11/17/21	1240		6						6					N	G	X	X	X	X	X	X	X	
DUP-10	11/17/21	—		5						5					N	G	X	X	X	X	X	X	X	ONLY COLLECTED 5 VOAS.
MW-75D_111721	11/17/21	1510		6						6					N	G	X	X	X	X	X	X	X	

240-160447 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: SH / Christina Weaver	ARCADIS	11/17/21 / 1620	Received by: NOVI COLD STORAGE	ARCADIS	11/17/21 / 1620
Relinquished by: Christina Weaver	ARCADIS	11/18/21 / 1038	Received by: Jeri Hoe	ETA	11/18/21 / 1039
Relinquished by: Jeri Hoe	ETA	11/18/21 1040	Received in Laboratory by: Tammy Lough	ETA	11-19-21 950

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12/7/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 160447
Canton Facility

Client ARCADIS Site Name _____ Cooler unpacked by: Danny Boyer

Cooler Received on 11-19-21 Opened on 11-19-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 1.2 °C Corrected Cooler Temp. 1.3 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
   -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? Yes No
11. Sufficient quantity received to perform indicated analyses? Yes No
12. Are these work share samples and all listed on the COC? Yes No
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# **HC157842**
14. Were VOAs on the COC? Yes No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 59072 Yes No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page Samples processed by:

No SIM on TB per corrected COC. [initials] 11/19/21

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

WI-NC-099

DATA VERIFICATION REPORT

December 07, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 160447-1
Sample date: 2021-11-17
Report received by CADENA: 2021-12-07
Initial Data Verification completed by CADENA: 2021-12-07
Number of Samples:5
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 514886 LCS recovery was outlying biased high for the following analyte: TRICHLOROETHENE. Associated client sample results were non-detect so qualification was not required based on this high bias QC outlier.

GCMS VOC QC batch MS/MSD recovery outliers were not determined using a client sample so qualification was not required based on these sample-specific QC outliers.

VOC SIM QC batch MS/MSD issues as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 160447-1

	Sample Name:	TRIP BLANK_177				MW-73D_111721				MW-73SR_111721				DUP-10				MW-75D_111721			
	Lab Sample ID:	2401604471				2401604472				2401604473				2401604474				2401604475			
	Sample Date:	11/17/2021				11/17/2021				11/17/2021				11/17/2021				11/17/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC																					
OSW-8260B																					
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	2.4	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	2.4	1.0	ug/l	---
OSW-8260BBSim																					
1,4-Dioxane	123-91-1					4.1	2.0	ug/l	---	ND	2.0	ug/l	---	2.9	2.0	ug/l	---	2.2	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

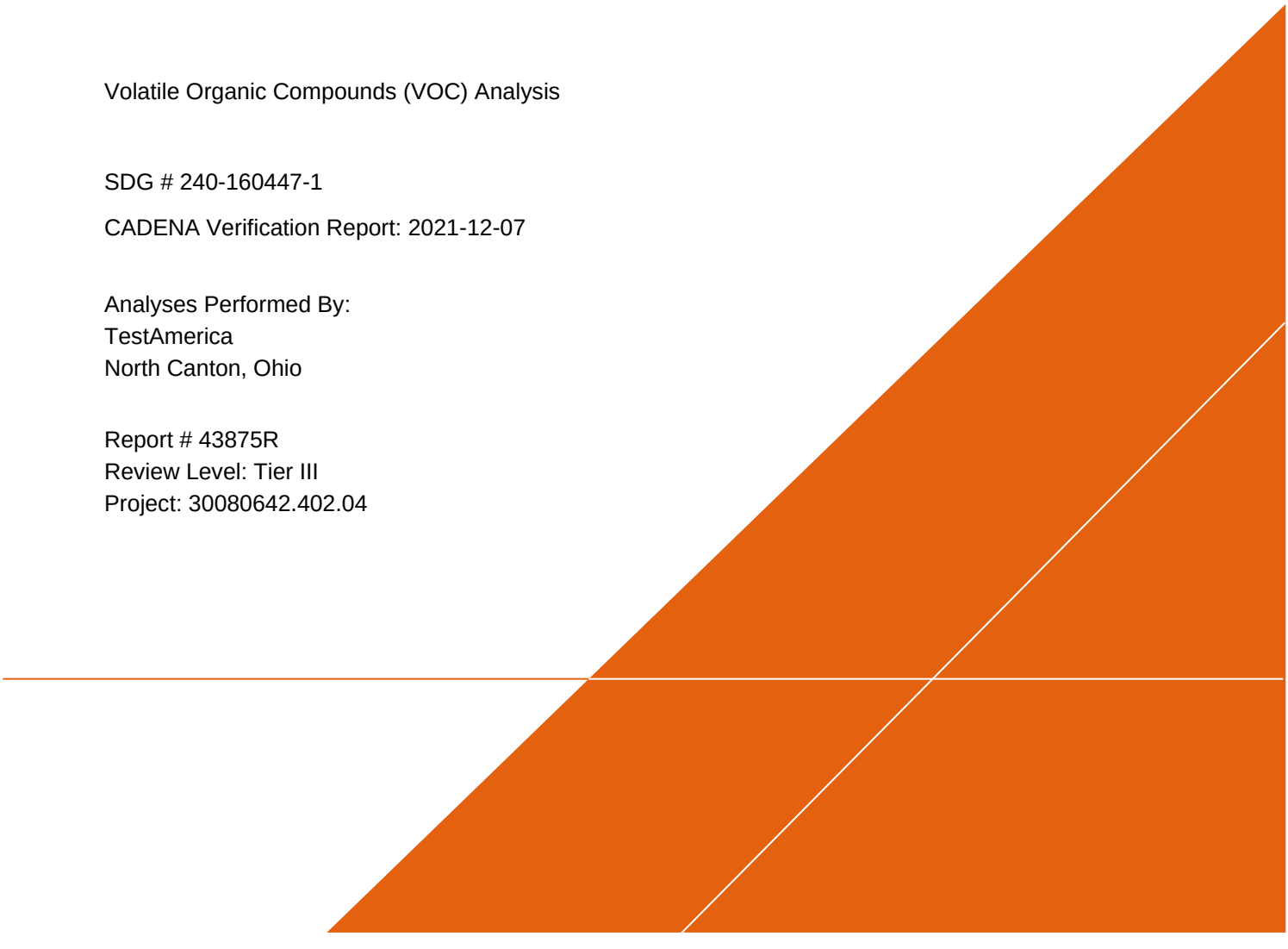
Volatile Organic Compounds (VOC) Analysis

SDG # 240-160447-1

CADENA Verification Report: 2021-12-07

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43875R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-160447-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_177	240-160447-1	Water	11/17/21		X	
MW-73D_111721	240-160447-2	Water	11/17/21		X	X
MW-73SR_111721	240-160447-3	Water	11/17/21		X	X
DUP-10	240-160447-4	Water	11/17/21	MW-73D_111721	X	X
MW-75D_111721	240-160447-5	Water	11/17/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Lab file ID	Compound	Criteria
TRIP BLANK_177 MW-73D_111721 MW-73SR_111721	Continuous Calibration Verification %D	UX000082.D	Trichloroethene	+29.3%
DUP-10 MW-75D_111721		UX000112.D	Trichloroethene	+28.6%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J

Initial/Continuing	Criteria	Sample Result	Qualification
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result (µg/L)	Duplicate Result (µg/L)	RPD
MW-73D_111721 / DUP-10	1,4-Dioxane	4.1	2.9	AC

Notes:

AC – Acceptable

The calculated differences between the parent sample and field duplicate were acceptable.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 20, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 20, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

1.2/13

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: SAMANTHA HINDLE	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client:
Phone: 248-994-2240	COURIER: CHRISTINA WEAVER	10 day		Lab sampling:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30080642.402.04	Shipping/Tracking No:			
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_177	—	—		X						1					N	G	X	X	X	X	X	X		1 Trip Blank
MW-73D_111721	11/17/21	1120		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-73SR_111721	11/17/21	1240		6						6					N	G	X	X	X	X	X	X	X	
DUP-10	11/17/21	—		5						5					N	G	X	X	X	X	X	X	X	ONLY COLLECTED 5 VOAS.
MW-75D_111721	11/17/21	1510		6						6					N	G	X	X	X	X	X	X	X	

240-160447 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
SH / [signature]	ARCADIS	11/17/21 / 1620	NOVI COLD STORAGE	ARCADIS	11/17/21 / 1620
Relinquished by: [signature]	Company: ARCADIS	Date/Time: 11/18/21 / 1038	Received by: [signature]	Company: ETA	Date/Time: 11/18/21 / 1039
Relinquished by: [signature]	Company: ETA	Date/Time: 11/18/21 1040	Received in Laboratory by: [signature]	Company: ETA	Date/Time: 11-19-21 950

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12/07/2021

Client Sample ID: TRIP BLANK_177

Lab Sample ID: 240-160447-1

Date Collected: 11/17/21 00:00
Matrix: Water
Date Received: 11/19/21 09:50

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/29/21 17:00	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/29/21 17:00	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/29/21 17:00	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/29/21 17:00	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/29/21 17:00	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/29/21 17:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*62 - 137*		*11/29/21 17:00*	*1*
4-Bromofluorobenzene (Surr)	*97*		*56 - 136*		*11/29/21 17:00*	*1*
Toluene-d8 (Surr)	*82*		*78 - 122*		*11/29/21 17:00*	*1*
Dibromofluoromethane (Surr)	*90*		*73 - 120*		*11/29/21 17:00*	*1*

Client Sample ID: MW-73D_111721

Lab Sample ID: 240-160447-2

Date Collected: 11/17/21 11:20
Matrix: Water
Date Received: 11/19/21 09:50

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**4.1**		2.0	0.86	ug/L			11/23/21 23:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*71*		*66 - 120*		*11/23/21 23:25*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/29/21 17:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/29/21 17:22	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/29/21 17:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/29/21 17:22	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/29/21 17:22	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/29/21 17:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*62 - 137*		*11/29/21 17:22*	*1*
4-Bromofluorobenzene (Surr)	*98*		*56 - 136*		*11/29/21 17:22*	*1*
Toluene-d8 (Surr)	*84*		*78 - 122*		*11/29/21 17:22*	*1*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*11/29/21 17:22*	*1*

Client Sample ID: MW-73SR_111721

Lab Sample ID: 240-160447-3

Date Collected: 11/17/21 12:40
Matrix: Water
Date Received: 11/19/21 09:50

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/23/21 23:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*72*		*66 - 120*		*11/23/21 23:50*	*1*

Client Sample ID: MW-73SR_111721

Lab Sample ID: 240-160447-3

Date Collected: 11/17/21 12:40
Matrix: Water
Date Received: 11/19/21 09:50

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/29/21 17:45	1
cis-1,2-Dichloroethene	**2.4**		1.0	0.46	ug/L			11/29/21 17:45	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/29/21 17:45	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/29/21 17:45	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/29/21 17:45	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/29/21 17:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*62 - 137*		*11/29/21 17:45*	*1*
4-Bromofluorobenzene (Surr)	*95*		*56 - 136*		*11/29/21 17:45*	*1*
Toluene-d8 (Surr)	*82*		*78 - 122*		*11/29/21 17:45*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*11/29/21 17:45*	*1*

Client Sample ID: DUP-10

Lab Sample ID: 240-160447-4

Date Collected: 11/17/21 00:00
Matrix: Water
Date Received: 11/19/21 09:50

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**2.9**		2.0	0.86	ug/L			11/24/21 00:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*73*		*66 - 120*		*11/24/21 00:15*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/30/21 14:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/30/21 14:57	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/30/21 14:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/30/21 14:57	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/30/21 14:57	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/30/21 14:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*		*11/30/21 14:57*	*1*
4-Bromofluorobenzene (Surr)	*92*		*56 - 136*		*11/30/21 14:57*	*1*
Toluene-d8 (Surr)	*84*		*78 - 122*		*11/30/21 14:57*	*1*
Dibromofluoromethane (Surr)	*85*		*73 - 120*		*11/30/21 14:57*	*1*

Client Sample ID: MW-75D_111721

Lab Sample ID: 240-160447-5

Date Collected: 11/17/21 15:10
Matrix: Water
Date Received: 11/19/21 09:50

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**2.2**		2.0	0.86	ug/L			11/24/21 00:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*		*11/24/21 00:40*	*1*

Client Sample ID: MW-75D_111721
Lab Sample ID: 240-160447-5

Date Collected: 11/17/21 15:10
Matrix: Water

Date Received: 11/19/21 09:50

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/30/21 15:20	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/30/21 15:20	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/30/21 15:20	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/30/21 15:20	1
Trichloroethene	1.0	U *+	1.0	0.44	ug/L			11/30/21 15:20	1
Vinyl chloride	**2.4**		1.0	0.45	ug/L			11/30/21 15:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*62 - 137*		*11/30/21 15:20*	*1*
4-Bromofluorobenzene (Surr)	*96*		*56 - 136*		*11/30/21 15:20*	*1*
Toluene-d8 (Surr)	*87*		*78 - 122*		*11/30/21 15:20*	*1*
Dibromofluoromethane (Surr)	*86*		*73 - 120*		*11/30/21 15:20*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-160508-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
12/7/2021 7:36:44 AM

Michael DelMonico, Project Manager I
(330)497-9396
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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160508-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160508-1

Job ID: 240-160508-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-160508-1

Comments
No additional comments.

Receipt
The samples were received on 11/20/2021 12:25 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.2º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160508-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160508-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-160508-1	TRIP BLANK_176	Water	11/18/21 00:00	11/20/21 12:25
240-160508-2	MW-99S_111821	Water	11/18/21 11:15	11/20/21 12:25
240-160508-3	MW-75SR_111821	Water	11/18/21 12:45	11/20/21 12:25
240-160508-4	MW-100S_111821	Water	11/18/21 15:25	11/20/21 12:25

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160508-1

Client Sample ID: TRIP BLANK_176 — Lab Sample ID: 240-160508-1

No Detections.

Client Sample ID: MW-99S_111821 — Lab Sample ID: 240-160508-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	0.58	J	1.0	0.46	ug/L	1		8260B	Total/NA

Client Sample ID: MW-75SR_111821 — Lab Sample ID: 240-160508-3

No Detections.

Client Sample ID: MW-100S_111821 — Lab Sample ID: 240-160508-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	1.0	J F1	2.0	0.86	ug/L	1		8260B SIM	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160508-1

Client Sample ID: TRIP BLANK_176

Date Collected: 11/18/21 00:00
Date Received: 11/20/21 12:25

Lab Sample ID: 240-160508-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/30/21 06:15	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/30/21 06:15	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/30/21 06:15	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/30/21 06:15	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/30/21 06:15	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/30/21 06:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/30/21 06:15*	*1*
4-Bromofluorobenzene (Surr)	*77*		*56 - 136*		*11/30/21 06:15*	*1*
Toluene-d8 (Surr)	*114*		*78 - 122*		*11/30/21 06:15*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*11/30/21 06:15*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160508-1

Client Sample ID: MW-99S_111821
Date Collected: 11/18/21 11:15
Date Received: 11/20/21 12:25

Lab Sample ID: 240-160508-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/23/21 21:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*66 - 120*		*11/23/21 21:31*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/30/21 06:37	1
cis-1,2-Dichloroethene	**0.58**	**J**	1.0	0.46	ug/L			11/30/21 06:37	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/30/21 06:37	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/30/21 06:37	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/30/21 06:37	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/30/21 06:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*109*		*62 - 137*		*11/30/21 06:37*	*1*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*		*11/30/21 06:37*	*1*
Toluene-d8 (Surr)	*114*		*78 - 122*		*11/30/21 06:37*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/30/21 06:37*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160508-1

Client Sample ID: MW-75SR_111821
Date Collected: 11/18/21 12:45
Date Received: 11/20/21 12:25

Lab Sample ID: 240-160508-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/24/21 01:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*66 - 120*		*11/24/21 01:07*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/30/21 06:59	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/30/21 06:59	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/30/21 06:59	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/30/21 06:59	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/30/21 06:59	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/30/21 06:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*		*11/30/21 06:59*	*1*
4-Bromofluorobenzene (Surr)	*72*		*56 - 136*		*11/30/21 06:59*	*1*
Toluene-d8 (Surr)	*105*		*78 - 122*		*11/30/21 06:59*	*1*
Dibromofluoromethane (Surr)	*87*		*73 - 120*		*11/30/21 06:59*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160508-1

Client Sample ID: MW-100S_111821

Lab Sample ID: 240-160508-4

Date Collected: 11/18/21 15:25

Matrix: Water

Date Received: 11/20/21 12:25

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	1.0	J F1	2.0	0.86	ug/L			11/24/21 22:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*73*		*66 - 120*		*11/24/21 22:33*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			12/01/21 16:49	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			12/01/21 16:49	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			12/01/21 16:49	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			12/01/21 16:49	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			12/01/21 16:49	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			12/01/21 16:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*12/01/21 16:49*	*1*
4-Bromofluorobenzene (Surr)	*72*		*56 - 136*		*12/01/21 16:49*	*1*
Toluene-d8 (Surr)	*106*		*78 - 122*		*12/01/21 16:49*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*12/01/21 16:49*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160508-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-160508-1	TRIP BLANK_176	105	77	114	95
240-160508-2	MW-99S_111821	109	78	114	94
240-160508-2 MS	MW-99S-MS_111821	100	83	105	88
240-160508-2 MSD	MW-99S-MSD_111821	90	78	97	79
240-160508-3	MW-75SR_111821	98	72	105	87
240-160508-4	MW-100S_111821	105	72	106	92
240-160508-4 MS	MW-100S-MS_111821	96	80	112	87
240-160508-4 MSD	MW-100S-MSD_111821	91	77	110	86
LCS 240-514928/4	Lab Control Sample	99	85	105	89
LCS 240-515231/4	Lab Control Sample	102	86	105	90
MB 240-514928/6	Method Blank	104	80	106	92
MB 240-515231/6	Method Blank	105	78	112	95

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-160508-2	MW-99S_111821	99
240-160508-2 MS	MW-99S-MS_111821	100
240-160508-2 MSD	MW-99S-MSD_111821	100
240-160508-3	MW-75SR_111821	99
240-160508-4	MW-100S_111821	73
240-160508-4 MS	MW-100S-MS_111821	75
240-160508-4 MSD	MW-100S-MSD_111821	75
LCS 240-514346/3	Lab Control Sample	97
LCS 240-514583/4	Lab Control Sample	75
MB 240-514346/4	Method Blank	96
MB 240-514583/5	Method Blank	75

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-514928/6
Matrix: Water
Analysis Batch: 514928

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/30/21 00:43	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/30/21 00:43	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/30/21 00:43	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/30/21 00:43	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/30/21 00:43	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/30/21 00:43	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*62 - 137*		*11/30/21 00:43*	*1*
4-Bromofluorobenzene (Surr)	*80*		*56 - 136*		*11/30/21 00:43*	*1*
Toluene-d8 (Surr)	*106*		*78 - 122*		*11/30/21 00:43*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*11/30/21 00:43*	*1*

Lab Sample ID: LCS 240-514928/4
Matrix: Water
Analysis Batch: 514928

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.0		ug/L		100	63 - 134
cis-1,2-Dichloroethene	10.0	9.75		ug/L		98	77 - 123
Tetrachloroethene	10.0	9.57		ug/L		96	76 - 123
trans-1,2-Dichloroethene	10.0	9.61		ug/L		96	75 - 124
Trichloroethene	10.0	8.60		ug/L		86	70 - 122
Vinyl chloride	10.0	10.7		ug/L		107	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*
Toluene-d8 (Surr)	*105*		*78 - 122*
Dibromofluoromethane (Surr)	*89*		*73 - 120*

Lab Sample ID: 240-160508-2 MS
Matrix: Water
Analysis Batch: 514928

Client Sample ID: MW-99S-MS_111821
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	6.96		ug/L		70	56 - 135
cis-1,2-Dichloroethene	0.58	J	10.0	8.89		ug/L		83	66 - 128
Tetrachloroethene	1.0	U	10.0	6.93		ug/L		69	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	7.70		ug/L		77	56 - 136
Trichloroethene	1.0	U	10.0	6.46		ug/L		65	61 - 124
Vinyl chloride	1.0	U	10.0	9.01		ug/L		90	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*83*		*56 - 136*
Toluene-d8 (Surr)	*105*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-160508-2 MS
Matrix: Water
Analysis Batch: 514928

Client Sample ID: MW-99S-MS_111821
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*88*		*73 - 120*

Lab Sample ID: 240-160508-2 MSD
Matrix: Water
Analysis Batch: 514928

Client Sample ID: MW-99S-MSD_111821
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	8.52		ug/L		85	56 - 135	20	26
cis-1,2-Dichloroethene	0.58	J	10.0	9.57		ug/L		90	66 - 128	7	14
Tetrachloroethene	1.0	U	10.0	8.00		ug/L		80	62 - 131	14	20
trans-1,2-Dichloroethene	1.0	U	10.0	8.62		ug/L		86	56 - 136	11	15
Trichloroethene	1.0	U	10.0	7.03		ug/L		70	61 - 124	8	15
Vinyl chloride	1.0	U	10.0	10.5		ug/L		105	43 - 157	15	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*
Toluene-d8 (Surr)	*97*		*78 - 122*
Dibromofluoromethane (Surr)	*79*		*73 - 120*

Lab Sample ID: MB 240-515231/6
Matrix: Water
Analysis Batch: 515231

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			12/01/21 13:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			12/01/21 13:52	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			12/01/21 13:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			12/01/21 13:52	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			12/01/21 13:52	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			12/01/21 13:52	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*12/01/21 13:52*	*1*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*		*12/01/21 13:52*	*1*
Toluene-d8 (Surr)	*112*		*78 - 122*		*12/01/21 13:52*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*12/01/21 13:52*	*1*

Lab Sample ID: LCS 240-515231/4
Matrix: Water
Analysis Batch: 515231

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.25		ug/L		93	63 - 134
cis-1,2-Dichloroethene	10.0	10.4		ug/L		104	77 - 123
Tetrachloroethene	10.0	9.40		ug/L		94	76 - 123
trans-1,2-Dichloroethene	10.0	10.1		ug/L		101	75 - 124
Trichloroethene	10.0	8.54		ug/L		85	70 - 122

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-515231/4
Matrix: Water
Analysis Batch: 515231

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Vinyl chloride			10.0	11.2		ug/L		112	60 - 144		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*
4-Bromofluorobenzene (Surr)	*86*		*56 - 136*
Toluene-d8 (Surr)	*105*		*78 - 122*
Dibromofluoromethane (Surr)	*90*		*73 - 120*

Lab Sample ID: 240-160508-4 MS
Matrix: Water
Analysis Batch: 515231

Client Sample ID: MW-100S-MS_111821
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,1-Dichloroethene	1.0	U	10.0	6.37		ug/L		64	56 - 135		
cis-1,2-Dichloroethene	1.0	U	10.0	9.43		ug/L		94	66 - 128		
Tetrachloroethene	1.0	U	10.0	9.16		ug/L		92	62 - 131		
trans-1,2-Dichloroethene	1.0	U	10.0	8.58		ug/L		86	56 - 136		
Trichloroethene	1.0	U	10.0	7.82		ug/L		78	61 - 124		
Vinyl chloride	1.0	U	10.0	9.70		ug/L		97	43 - 157		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*
4-Bromofluorobenzene (Surr)	*80*		*56 - 136*
Toluene-d8 (Surr)	*112*		*78 - 122*
Dibromofluoromethane (Surr)	*87*		*73 - 120*

Lab Sample ID: 240-160508-4 MSD
Matrix: Water
Analysis Batch: 515231

Client Sample ID: MW-100S-MSD_111821
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	7.01		ug/L		70	56 - 135	10	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.59		ug/L		96	66 - 128	2	14
Tetrachloroethene	1.0	U	10.0	10.0		ug/L		100	62 - 131	9	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.21		ug/L		92	56 - 136	7	15
Trichloroethene	1.0	U	10.0	8.22		ug/L		82	61 - 124	5	15
Vinyl chloride	1.0	U	10.0	10.2		ug/L		102	43 - 157	5	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*91*		*62 - 137*
4-Bromofluorobenzene (Surr)	*77*		*56 - 136*
Toluene-d8 (Surr)	*110*		*78 - 122*
Dibromofluoromethane (Surr)	*86*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-514346/4
Matrix: Water
Analysis Batch: 514346

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/23/21 16:45	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*66 - 120*		*11/23/21 16:45*	*1*

Lab Sample ID: LCS 240-514346/3
Matrix: Water
Analysis Batch: 514346

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	9.09		ug/L		91	80 - 122		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*66 - 120*

Lab Sample ID: 240-160508-2 MS
Matrix: Water
Analysis Batch: 514346

Client Sample ID: MW-99S-MS_111821
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	9.43		ug/L		94	51 - 153		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*66 - 120*

Lab Sample ID: 240-160508-2 MSD
Matrix: Water
Analysis Batch: 514346

Client Sample ID: MW-99S-MSD_111821
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.76		ug/L		98	51 - 153	3	16

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*66 - 120*

Lab Sample ID: MB 240-514583/5
Matrix: Water
Analysis Batch: 514583

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/24/21 20:04	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*		*11/24/21 20:04*	*1*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-514583/4
Matrix: Water
Analysis Batch: 514583

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.2		ug/L		102	80 - 122		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*

Lab Sample ID: 240-160508-4 MS
Matrix: Water
Analysis Batch: 514583

Client Sample ID: MW-100S-MS_111821
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	1.0	J F1	10.0	11.9		ug/L		109	51 - 153		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*

Lab Sample ID: 240-160508-4 MSD
Matrix: Water
Analysis Batch: 514583

Client Sample ID: MW-100S-MSD_111821
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	1.0	J F1	10.0	10.5		ug/L		95	51 - 153	13	16

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*

GC/MS VOA

Analysis Batch: 514346

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-160508-2	MW-99S_111821	Total/NA	Water	8260B SIM	
240-160508-3	MW-75SR_111821	Total/NA	Water	8260B SIM	
MB 240-514346/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-514346/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-160508-2 MS	MW-99S-MS_111821	Total/NA	Water	8260B SIM	
240-160508-2 MSD	MW-99S-MSD_111821	Total/NA	Water	8260B SIM	

Analysis Batch: 514583

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-160508-4	MW-100S_111821	Total/NA	Water	8260B SIM	
MB 240-514583/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-514583/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-160508-4 MS	MW-100S-MS_111821	Total/NA	Water	8260B SIM	
240-160508-4 MSD	MW-100S-MSD_111821	Total/NA	Water	8260B SIM	

Analysis Batch: 514928

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-160508-1	TRIP BLANK_176	Total/NA	Water	8260B	
240-160508-2	MW-99S_111821	Total/NA	Water	8260B	
240-160508-3	MW-75SR_111821	Total/NA	Water	8260B	
MB 240-514928/6	Method Blank	Total/NA	Water	8260B	
LCS 240-514928/4	Lab Control Sample	Total/NA	Water	8260B	
240-160508-2 MS	MW-99S-MS_111821	Total/NA	Water	8260B	
240-160508-2 MSD	MW-99S-MSD_111821	Total/NA	Water	8260B	

Analysis Batch: 515231

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-160508-4	MW-100S_111821	Total/NA	Water	8260B	
MB 240-515231/6	Method Blank	Total/NA	Water	8260B	
LCS 240-515231/4	Lab Control Sample	Total/NA	Water	8260B	
240-160508-4 MS	MW-100S-MS_111821	Total/NA	Water	8260B	
240-160508-4 MSD	MW-100S-MSD_111821	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160508-1

Client Sample ID: TRIP BLANK_176
Lab Sample ID: 240-160508-1
Date Collected: 11/18/21 00:00
Matrix: Water
Date Received: 11/20/21 12:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	514928	11/30/21 06:15	LEE	TAL CAN

Client Sample ID: MW-99S_111821
Lab Sample ID: 240-160508-2
Date Collected: 11/18/21 11:15
Matrix: Water
Date Received: 11/20/21 12:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	514928	11/30/21 06:37	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	514346	11/23/21 21:31	CS	TAL CAN

Client Sample ID: MW-75SR_111821
Lab Sample ID: 240-160508-3
Date Collected: 11/18/21 12:45
Matrix: Water
Date Received: 11/20/21 12:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	514928	11/30/21 06:59	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	514346	11/24/21 01:07	CS	TAL CAN

Client Sample ID: MW-100S_111821
Lab Sample ID: 240-160508-4
Date Collected: 11/18/21 15:25
Matrix: Water
Date Received: 11/20/21 12:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	515231	12/01/21 16:49	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	514583	11/24/21 22:33	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160508-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No: 1 of 1 COCs
Phone: 248-994-2240	Sampler Name: SAMANTHA HINDLE	TAT if different from below: ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day	For lab use only
Project Name: Ford LTP Off-Site	COURIER: CHRISTINA WEAVER	10 day	Walk-in client
Project Number: 30080642.402.04	Method of Shipment/Carrier:		Lab sampling
PO # 30080642.402.04	Shipping/Tracking No:		Job/SDG No:

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_176	—	—		X						1					N	G	X	X	X	X	X	X		1 Trip Blank
MW-99S_111821	11/18/21	1115		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-99S-MS_111821	11/18/21	1115		X						6					N	G	X	X	X	X	X	X	X	RUN MS/MSD
MW-99S-MSD_111821	11/18/21	1115		X						6					N	G	X	X	X	X	X	X	X	RUN MS/MSD
MW-75SR_111821	11/18/21	1245		X						6					N	G	X	X	X	X	X	X	X	
MW-100S_111821	11/18/21	1525		X						6					N	G	X	X	X	X	X	X	X	
MW-100S-MS_111821	11/18/21	1525		X						6					N	G	X	X	X	X	X	X	X	RUN MS/MSD
MW-100S-MSD_111821	11/18/21	1525		X						6					N	G	X	X	X	X	X	X	X	RUN MS/MSD

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained l: ☐ Return to Client ☑ Disposal By Lab ☐ Archiv

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

240-160508 Chain of Custody

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
SH / Christina Weaver	ARCADIS	11/18/21 / 1700	NOVI COLD STORAGE	ARCADIS	11/18/21 / 1700
Christina Weaver	ARCADIS	11/19/21 / 1013	Jessi Hale	ETA	11/19/21 / 1013
Jessi Hale	ETA	11/19/21 1017	Received in Laboratory by: Tammy Boyer	Company: ETA	Date/Time: 11-20-21 800

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12/7/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 160508
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: [signature]

Cooler Received on 11-20-21 Opened on 11-20-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.1 °C Corrected Cooler Temp. 0.2 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
   -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? Yes No
11. Sufficient quantity received to perform indicated analyses? Yes No
12. Are these work share samples and all listed on the COC? Yes No
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# **HC157842**
14. Were VOAs on the COC? Yes No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 60358 Yes No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

WI-NC-099

DATA VERIFICATION REPORT

December 07, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 160508-1
Sample date: 2021-11-18
Report received by CADENA: 2021-12-07
Initial Data Verification completed by CADENA: 2021-12-07
Number of Samples:4
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, MS/MSD Recovery, MS/MSD RPD, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 160508-1

		Sample Name:	TRIP BLANK_176				MW-99S_111821				MW-75SR_111821				MW-100S_111821			
		Lab Sample ID:	2401605081				2401605082				2401605083				2401605084			
		Sample Date:	11/18/2021				11/18/2021				11/18/2021				11/18/2021			
	Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC																		
	OSW-8260B																	
	1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	0.58	1.0	ug/l	J	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	OSW-8260BBSim																	
	1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---	1.0	2.0	ug/l	J

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

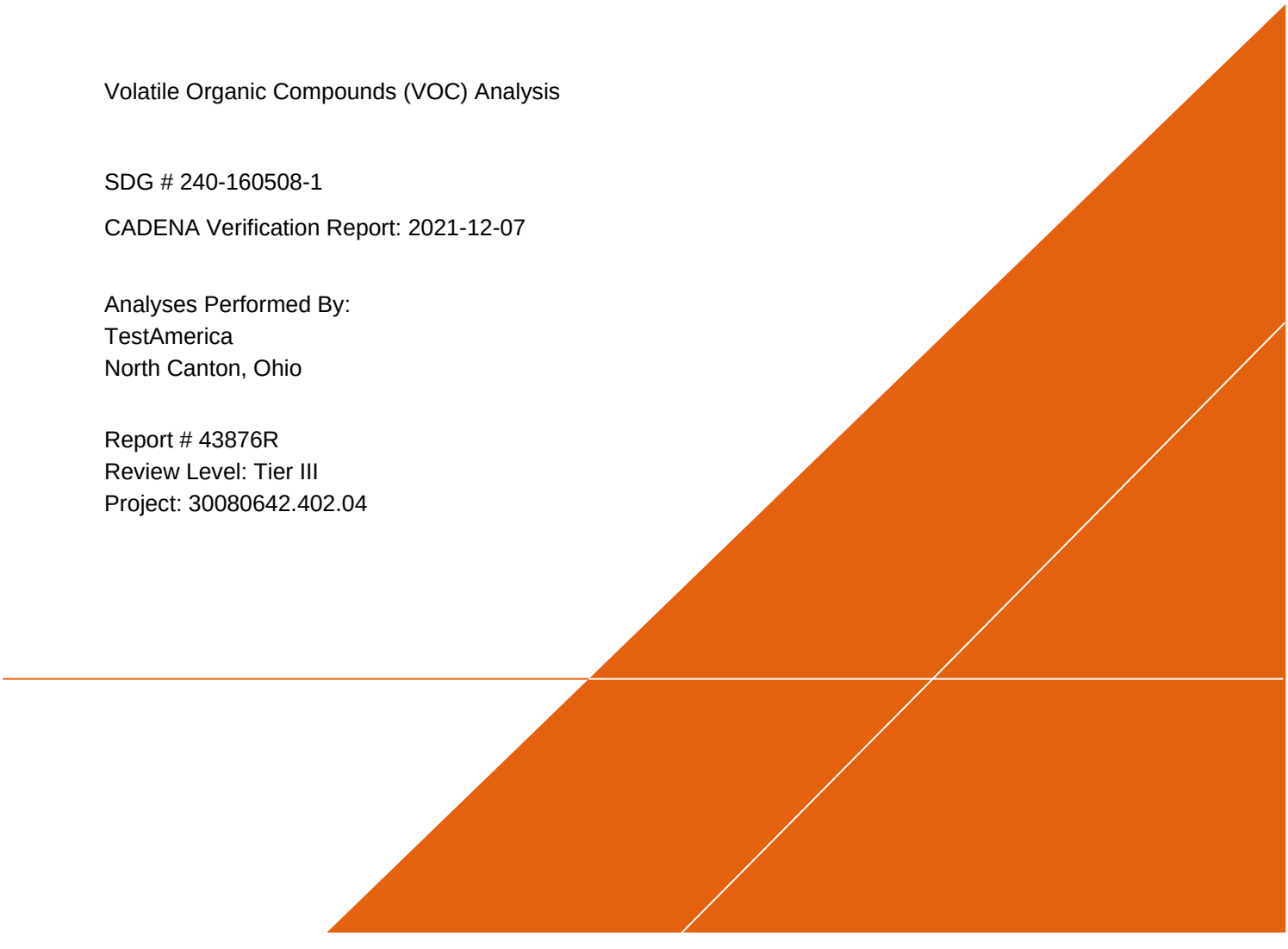
Volatile Organic Compounds (VOC) Analysis

SDG # 240-160508-1

CADENA Verification Report: 2021-12-07

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43876R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-160508-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_176	240-160508-1	Water	11/18/21		X	
MW-99S_111821	240-160508-2	Water	11/18/21		X	X
MW-75SR_111821	240-160508-3	Water	11/18/21		X	X
MW-100S_111821	240-160508-4	Water	11/18/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 20, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 20, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN
190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	☐ DW ☐ NPDES ☐ RCRA ☐ Other	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500		Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377		Sampler Name: SAMANTHA HINDLE	TAT if different from below		Walk-in client
Phone: 248-994-2240		COURIER: CHRISTINA WEAVER	10 day ☑ 2 weeks ☐ 3 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Lab sampling
Project Name: Ford LTP Off-Site		Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30080642.402.04		Shipping/Tracking No:			
PO # 30080642.402.04					

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_176	—	—		X						1					N	G	X	X	X	X	X	X		1 Trip Blank
MW-99S_111821	11/18/21	1115		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-99S-MS_111821	11/18/21	1115		X						6					N	G	X	X	X	X	X	X	X	RUN MS/MSD
MW-99S-MSD_111821	11/18/21	1115		X						6					N	G	X	X	X	X	X	X	X	RUN MS/MSD
MW-75SR_111821	11/18/21	1245		X						6					N	G	X	X	X	X	X	X	X	
MW-100S_111821	11/18/21	1525		X						6					N	G	X	X	X	X	X	X	X	
MW-100S-MS_111821	11/18/21	1525		X						6					N	G	X	X	X	X	X	X	X	RUN MS/MSD
MW-100S-MSD_111821	11/18/21	1525		X						6					N	G	X	X	X	X	X	X	X	RUN MS/MSD

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained l
☐ Return to Client ☑ Disposal By Lab ☐ Archiv

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

240-160508 Chain of Custody

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
SH / Christina Weaver	ARCADIS	11/18/21 / 1700	NOVI COLD STORAGE	ARCADIS	11/18/21 / 1700
Christina Weaver	ARCADIS	11/19/21 / 1013	Jeri Hall	ETA	11/19/21 / 1013
Jeri Hall	ETA	11/19/21 1017	Tammy Boyer	ETA	11-20-21 800

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12/07/2021

Client Sample ID: TRIP BLANK_176
Lab Sample ID: 240-160508-1
Date Collected: 11/18/21 00:00
Matrix: Water
Date Received: 11/20/21 12:25

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/30/21 06:15	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/30/21 06:15	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/30/21 06:15	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/30/21 06:15	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/30/21 06:15	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/30/21 06:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/30/21 06:15*	*1*
4-Bromofluorobenzene (Surr)	*77*		*56 - 136*		*11/30/21 06:15*	*1*
Toluene-d8 (Surr)	*114*		*78 - 122*		*11/30/21 06:15*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*11/30/21 06:15*	*1*

Client Sample ID: MW-99S_111821
Lab Sample ID: 240-160508-2
Date Collected: 11/18/21 11:15
Matrix: Water
Date Received: 11/20/21 12:25

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/23/21 21:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*66 - 120*		*11/23/21 21:31*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/30/21 06:37	1
cis-1,2-Dichloroethene	**0.58**	**J**	1.0	0.46	ug/L			11/30/21 06:37	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/30/21 06:37	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/30/21 06:37	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/30/21 06:37	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/30/21 06:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*109*		*62 - 137*		*11/30/21 06:37*	*1*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*		*11/30/21 06:37*	*1*
Toluene-d8 (Surr)	*114*		*78 - 122*		*11/30/21 06:37*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/30/21 06:37*	*1*

Client Sample ID: MW-75SR_111821
Lab Sample ID: 240-160508-3
Date Collected: 11/18/21 12:45
Matrix: Water
Date Received: 11/20/21 12:25

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/24/21 01:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*66 - 120*		*11/24/21 01:07*	*1*

Client Sample ID: MW-75SR_111821
Lab Sample ID: 240-160508-3

Date Collected: 11/18/21 12:45
Matrix: Water
Date Received: 11/20/21 12:25

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/30/21 06:59	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/30/21 06:59	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/30/21 06:59	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/30/21 06:59	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/30/21 06:59	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/30/21 06:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*		*11/30/21 06:59*	*1*
4-Bromofluorobenzene (Surr)	*72*		*56 - 136*		*11/30/21 06:59*	*1*
Toluene-d8 (Surr)	*105*		*78 - 122*		*11/30/21 06:59*	*1*
Dibromofluoromethane (Surr)	*87*		*73 - 120*		*11/30/21 06:59*	*1*

Client Sample ID: MW-100S_111821
Lab Sample ID: 240-160508-4

Date Collected: 11/18/21 15:25
Matrix: Water
Date Received: 11/20/21 12:25

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**1.0**	**J F1**	2.0	0.86	ug/L			11/24/21 22:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*73*		*66 - 120*		*11/24/21 22:33*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			12/01/21 16:49	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			12/01/21 16:49	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			12/01/21 16:49	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			12/01/21 16:49	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			12/01/21 16:49	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			12/01/21 16:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*12/01/21 16:49*	*1*
4-Bromofluorobenzene (Surr)	*72*		*56 - 136*		*12/01/21 16:49*	*1*
Toluene-d8 (Surr)	*106*		*78 - 122*		*12/01/21 16:49*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*12/01/21 16:49*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-160089-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/29/2021 8:51:49 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160089-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
E	Result exceeded calibration range.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160089-1

Job ID: 240-160089-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-160089-1

Comments
No additional comments.

Receipt
The samples were received on 11/13/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.5º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160089-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160089-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-160089-1	TRIP BLANK_122	Water	11/11/21 00:00	11/13/21 08:00
240-160089-2	MW-76S_111121	Water	11/11/21 09:35	11/13/21 08:00
240-160089-3	MW-76_111121	Water	11/11/21 13:30	11/13/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160089-1

Client Sample ID: TRIP BLANK_122 — Lab Sample ID: 240-160089-1

No Detections.

Client Sample ID: MW-76S_111121 — Lab Sample ID: 240-160089-2

No Detections.

Client Sample ID: MW-76_111121 — Lab Sample ID: 240-160089-3

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160089-1

Client Sample ID: TRIP BLANK_122
Date Collected: 11/11/21 00:00
Date Received: 11/13/21 08:00

Lab Sample ID: 240-160089-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/22/21 20:41	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/22/21 20:41	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/22/21 20:41	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/22/21 20:41	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/22/21 20:41	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/22/21 20:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*62 - 137*		*11/22/21 20:41*	*1*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*		*11/22/21 20:41*	*1*
Toluene-d8 (Surr)	*103*		*78 - 122*		*11/22/21 20:41*	*1*
Dibromofluoromethane (Surr)	*113*		*73 - 120*		*11/22/21 20:41*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160089-1

Client Sample ID: MW-76S_111121
Date Collected: 11/11/21 09:35
Date Received: 11/13/21 08:00

Lab Sample ID: 240-160089-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/19/21 01:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*		*11/19/21 01:30*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/22/21 23:04	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/22/21 23:04	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/22/21 23:04	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/22/21 23:04	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/22/21 23:04	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/22/21 23:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/22/21 23:04*	*1*
4-Bromofluorobenzene (Surr)	*95*		*56 - 136*		*11/22/21 23:04*	*1*
Toluene-d8 (Surr)	*101*		*78 - 122*		*11/22/21 23:04*	*1*
Dibromofluoromethane (Surr)	*112*		*73 - 120*		*11/22/21 23:04*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160089-1

Client Sample ID: MW-76_111121
Date Collected: 11/11/21 13:30
Date Received: 11/13/21 08:00

Lab Sample ID: 240-160089-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/19/21 01:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*66 - 120*		*11/19/21 01:54*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/23/21 17:58	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/23/21 17:58	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/23/21 17:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/23/21 17:58	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/23/21 17:58	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/23/21 17:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/23/21 17:58*	*1*
4-Bromofluorobenzene (Surr)	*88*		*56 - 136*		*11/23/21 17:58*	*1*
Toluene-d8 (Surr)	*93*		*78 - 122*		*11/23/21 17:58*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/23/21 17:58*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160089-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159807-B-1 MS	Matrix Spike	101	100	109	115
240-159807-B-1 MSD	Matrix Spike Duplicate	98	99	109	112
240-160089-1	TRIP BLANK_122	104	94	103	113
240-160089-2	MW-76S_111121	105	95	101	112
240-160089-3	MW-76_111121	93	88	93	98
240-160551-B-10 MS	Matrix Spike	95	95	104	104
240-160551-B-10 MSD	Matrix Spike Duplicate	93	98	106	103
LCS 240-514100/5	Lab Control Sample	105	102	109	115
LCS 240-514335/5	Lab Control Sample	90	94	98	103
MB 240-514100/8	Method Blank	103	98	109	114
MB 240-514335/8	Method Blank	92	89	95	101

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159739-G-3 MS	Matrix Spike	74
240-159739-M-3 MSD	Matrix Spike Duplicate	75
240-160089-2	MW-76S_111121	77
240-160089-3	MW-76_111121	92
LCS 240-513700/4	Lab Control Sample	75
MB 240-513700/5	Method Blank	77

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-514100/8
Matrix: Water
Analysis Batch: 514100

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/22/21 13:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/22/21 13:57	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/22/21 13:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/22/21 13:57	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/22/21 13:57	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/22/21 13:57	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*		*11/22/21 13:57*	*1*
4-Bromofluorobenzene (Surr)	*98*		*56 - 136*		*11/22/21 13:57*	*1*
Toluene-d8 (Surr)	*109*		*78 - 122*		*11/22/21 13:57*	*1*
Dibromofluoromethane (Surr)	*114*		*73 - 120*		*11/22/21 13:57*	*1*

Lab Sample ID: LCS 240-514100/5
Matrix: Water
Analysis Batch: 514100

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	27.2		ug/L		109	63 - 134
cis-1,2-Dichloroethene	25.0	24.6		ug/L		98	77 - 123
Tetrachloroethene	25.0	26.8		ug/L		107	76 - 123
trans-1,2-Dichloroethene	25.0	25.7		ug/L		103	75 - 124
Trichloroethene	25.0	26.2		ug/L		105	70 - 122
Vinyl chloride	25.0	21.7		ug/L		87	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*
4-Bromofluorobenzene (Surr)	*102*		*56 - 136*
Toluene-d8 (Surr)	*109*		*78 - 122*
Dibromofluoromethane (Surr)	*115*		*73 - 120*

Lab Sample ID: 240-159807-B-1 MS
Matrix: Water
Analysis Batch: 514100

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,2-Dichloroethene	130		83.3	200		ug/L		90	66 - 128
Tetrachloroethene	120		83.3	212	E	ug/L		105	62 - 131
trans-1,2-Dichloroethene	4.3		83.3	89.0		ug/L		102	56 - 136
Trichloroethene	7.8		83.3	94.6		ug/L		104	61 - 124
Vinyl chloride	3.3	U	83.3	68.5		ug/L		82	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*101*		*62 - 137*
4-Bromofluorobenzene (Surr)	*100*		*56 - 136*
Toluene-d8 (Surr)	*109*		*78 - 122*
Dibromofluoromethane (Surr)	*115*		*73 - 120*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159807-B-1 MSD
Matrix: Water
Analysis Batch: 514100

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
cis-1,2-Dichloroethene	130		83.3	197		ug/L		86	66 - 128	1	14
Tetrachloroethene	120		83.3	211	E	ug/L		104	62 - 131	0	20
trans-1,2-Dichloroethene	4.3		83.3	85.6		ug/L		98	56 - 136	4	15
Trichloroethene	7.8		83.3	92.6		ug/L		102	61 - 124	2	15
Vinyl chloride	3.3	U	83.3	69.8		ug/L		84	43 - 157	2	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*
4-Bromofluorobenzene (Surr)	*99*		*56 - 136*
Toluene-d8 (Surr)	*109*		*78 - 122*
Dibromofluoromethane (Surr)	*112*		*73 - 120*

Lab Sample ID: MB 240-514335/8
Matrix: Water
Analysis Batch: 514335

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/23/21 15:59	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/23/21 15:59	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/23/21 15:59	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/23/21 15:59	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/23/21 15:59	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/23/21 15:59	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/23/21 15:59*	*1*
4-Bromofluorobenzene (Surr)	*89*		*56 - 136*		*11/23/21 15:59*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*11/23/21 15:59*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/23/21 15:59*	*1*

Lab Sample ID: LCS 240-514335/5
Matrix: Water
Analysis Batch: 514335

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	25.7		ug/L		103	63 - 134
cis-1,2-Dichloroethene	25.0	23.8		ug/L		95	77 - 123
Tetrachloroethene	25.0	26.5		ug/L		106	76 - 123
trans-1,2-Dichloroethene	25.0	24.4		ug/L		98	75 - 124
Trichloroethene	25.0	25.1		ug/L		101	70 - 122
Vinyl chloride	25.0	20.3		ug/L		81	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*
Toluene-d8 (Surr)	*98*		*78 - 122*
Dibromofluoromethane (Surr)	*103*		*73 - 120*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-160551-B-10 MS
Matrix: Water
Analysis Batch: 514335

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	250	U	6250	6360		ug/L		102	56 - 135
cis-1,2-Dichloroethene	250	U	6250	5850		ug/L		94	66 - 128
Tetrachloroethene	250	U	6250	6810		ug/L		109	62 - 131
trans-1,2-Dichloroethene	250	U	6250	6190		ug/L		99	56 - 136
Trichloroethene	250	U	6250	6660		ug/L		107	61 - 124
Vinyl chloride	250	U	6250	5070		ug/L		81	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*95*		*62 - 137*
4-Bromofluorobenzene (Surr)	*95*		*56 - 136*
Toluene-d8 (Surr)	*104*		*78 - 122*
Dibromofluoromethane (Surr)	*104*		*73 - 120*

Lab Sample ID: 240-160551-B-10 MSD
Matrix: Water
Analysis Batch: 514335

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	250	U	6250	6130		ug/L		98	56 - 135	4	26
cis-1,2-Dichloroethene	250	U	6250	5840		ug/L		93	66 - 128	0	14
Tetrachloroethene	250	U	6250	6750		ug/L		108	62 - 131	1	20
trans-1,2-Dichloroethene	250	U	6250	6000		ug/L		96	56 - 136	3	15
Trichloroethene	250	U	6250	6420		ug/L		103	61 - 124	4	15
Vinyl chloride	250	U	6250	4950		ug/L		79	43 - 157	2	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*98*		*56 - 136*
Toluene-d8 (Surr)	*106*		*78 - 122*
Dibromofluoromethane (Surr)	*103*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513700/5
Matrix: Water
Analysis Batch: 513700

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 19:41	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*		*11/18/21 19:41*	*1*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-513700/4
Matrix: Water
Analysis Batch: 513700

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.4		ug/L		104	80 - 122		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*

Lab Sample ID: 240-159739-G-3 MS
Matrix: Water
Analysis Batch: 513700

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U F1	10.0	10.4		ug/L		104	51 - 153		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*74*		*66 - 120*

Lab Sample ID: 240-159739-M-3 MSD
Matrix: Water
Analysis Batch: 513700

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153	2	16

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160089-1

GC/MS VOA

Analysis Batch: 513700

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-160089-2	MW-76S_111121	Total/NA	Water	8260B SIM	
240-160089-3	MW-76_111121	Total/NA	Water	8260B SIM	
MB 240-513700/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513700/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159739-G-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159739-M-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 514100

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-160089-1	TRIP BLANK_122	Total/NA	Water	8260B	
240-160089-2	MW-76S_111121	Total/NA	Water	8260B	
MB 240-514100/8	Method Blank	Total/NA	Water	8260B	
LCS 240-514100/5	Lab Control Sample	Total/NA	Water	8260B	
240-159807-B-1 MS	Matrix Spike	Total/NA	Water	8260B	
240-159807-B-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 514335

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-160089-3	MW-76_111121	Total/NA	Water	8260B	
MB 240-514335/8	Method Blank	Total/NA	Water	8260B	
LCS 240-514335/5	Lab Control Sample	Total/NA	Water	8260B	
240-160551-B-10 MS	Matrix Spike	Total/NA	Water	8260B	
240-160551-B-10 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160089-1

Client Sample ID: TRIP BLANK_122

Lab Sample ID: 240-160089-1
Date Collected: 11/11/21 00:00
Matrix: Water
Date Received: 11/13/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	514100	11/22/21 20:41	SAM	TAL CAN

Client Sample ID: MW-76S_111121

Lab Sample ID: 240-160089-2
Date Collected: 11/11/21 09:35
Matrix: Water
Date Received: 11/13/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	514100	11/22/21 23:04	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	513700	11/19/21 01:30	CS	TAL CAN

Client Sample ID: MW-76_111121

Lab Sample ID: 240-160089-3
Date Collected: 11/11/21 13:30
Matrix: Water
Date Received: 11/13/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	514335	11/23/21 17:58	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	513700	11/19/21 01:54	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160089-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

1.4/1.5

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Sommer Guy	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client; Lab sampling
Phone: 248-994-2240	Method of Shipment/Carrier:			Job/SDG No:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_122	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-765-111121	11/11/21	9:35		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-76-111121	11/11/21	13:30		X						6					N	G	X	X	X	X	X	X	X	↓

240-160089 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Sommer Guy	Arcadis	11/11/21 14:30	Novi Cold Storage	Arcadis	11/11/21 14:30
[illegible]	ARCADIS	11/12/21 1000	[illegible]	GS	11/12/21 1000
[illegible]	GS	11/12/21 1001	Received in Laboratory by: [illegible]	EDA	11-13-21 0830

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11/29/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 160089**
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Adam Garrett

Cooler Received on 11-13-21 Opened on 11-13-21

FedEx: 1st Grd (Exp) UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 1.4 °C Corrected Cooler Temp. 1.5 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# **HC157842**
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____ (Yes) No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

No SIM on TB per corrected CoC.

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

WI-NC-099

DATA VERIFICATION REPORT

November 29, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 160089-1
Sample date: 2021-11-11
Report received by CADENA: 2021-11-29
Initial Data Verification completed by CADENA: 2021-11-29
Number of Samples:3
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 160089-1

		Sample Name:	TRIP BLANK_122				MW-76S_111121				MW-76_111121			
		Lab Sample ID:	2401600891				2401600892				2401600893			
		Sample Date:	11/11/2021				11/11/2021				11/11/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC													
OSW-8260B													
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim													
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

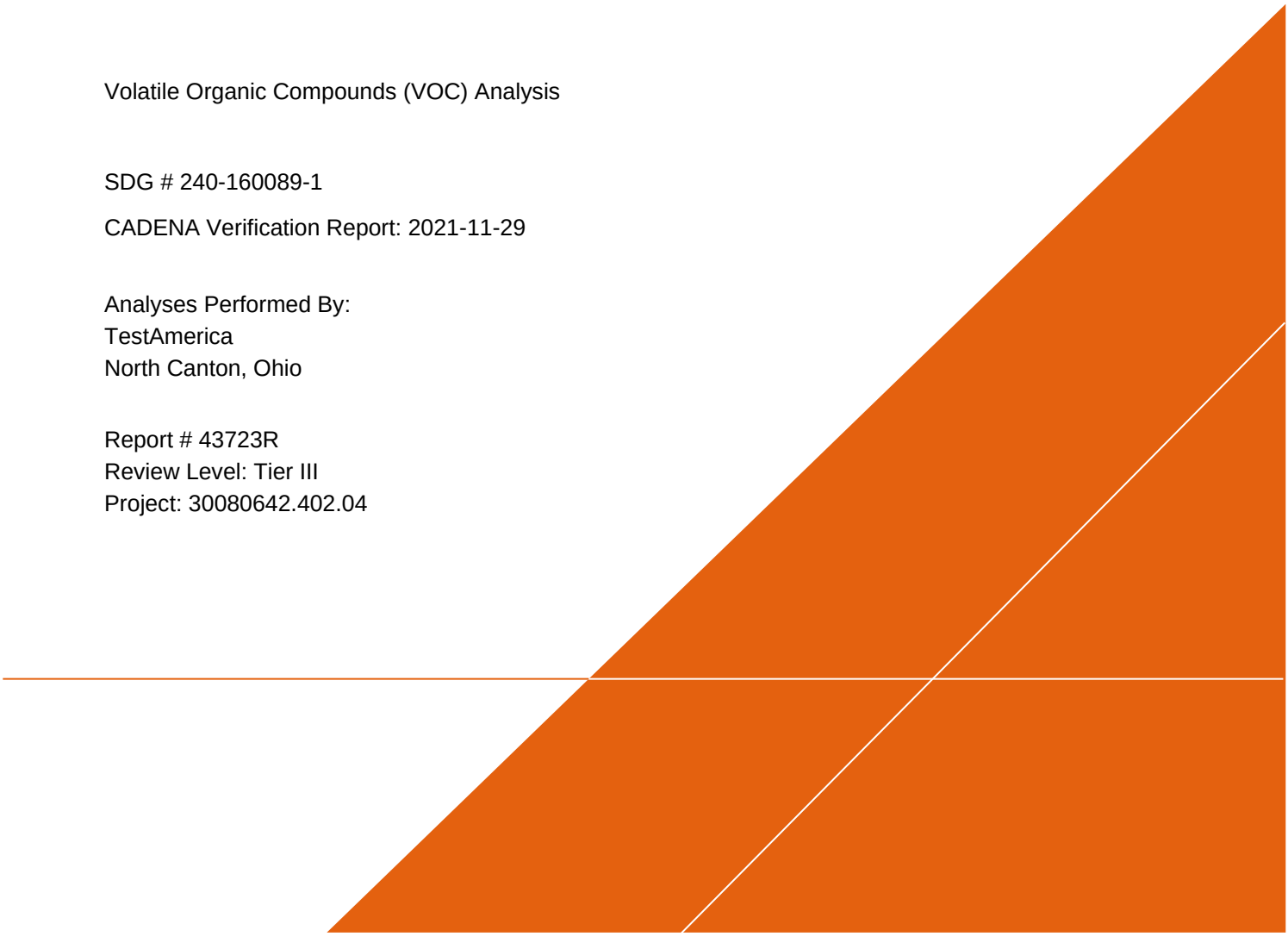
Volatile Organic Compounds (VOC) Analysis

SDG # 240-160089-1

CADENA Verification Report: 2021-11-29

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43723R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-160089-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_122	240-160089-1	Water	11/11/21		X	
MW-76S_111121	240-160089-2	Water	11/11/21		X	X
MW-76_111121	240-160089-3	Water	11/11/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190

1.4/1.5

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Client Project Manager: Kris Hinskey	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Telephone: 248-994-2240	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Email: kristoffer.hinskey@arcadis.com			Walk-in client
Project Name: Ford LTP Off-Site	Sampler Name: Sommer Guy	TAT if different from below: 10 day; 3 weeks; 2 weeks; 1 week; 2 days; 1 day		Lab sampling
Project Number: 30080642.402.04	Method of Shipment/Carrier:			Job/SDG No:
PO # 30080642.402.04	Shipping/Tracking No:			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_122	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-765-111121	11/11/21	9:35		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B; 3 VOAs for 8260B SIM
MW-76-111121	11/11/21	13:30		X						6					N	G	X	X	X	X	X	X	X	↓

240-160089 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Sommer Guy	Arcadis	11/11/21 14:30	Novi Cold Storage	Arcadis	11/11/21 14:30
	ARCADIS	11/12/21 1000		GS	11/12/21 1000
	GS	11/12/21 1001	Received in Laboratory by: Adam Gamez	EDA	11-13-21 0830

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11/29/2021

Client Sample ID: TRIP BLANK_122
Lab Sample ID: 240-160089-1
Date Collected: 11/11/21 00:00
Matrix: Water
Date Received: 11/13/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/22/21 20:41	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/22/21 20:41	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/22/21 20:41	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/22/21 20:41	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/22/21 20:41	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/22/21 20:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*62 - 137*		*11/22/21 20:41*	*1*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*		*11/22/21 20:41*	*1*
Toluene-d8 (Surr)	*103*		*78 - 122*		*11/22/21 20:41*	*1*
Dibromofluoromethane (Surr)	*113*		*73 - 120*		*11/22/21 20:41*	*1*

Client Sample ID: MW-76S_111121
Lab Sample ID: 240-160089-2
Date Collected: 11/11/21 09:35
Matrix: Water
Date Received: 11/13/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/19/21 01:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*		*11/19/21 01:30*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/22/21 23:04	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/22/21 23:04	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/22/21 23:04	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/22/21 23:04	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/22/21 23:04	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/22/21 23:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/22/21 23:04*	*1*
4-Bromofluorobenzene (Surr)	*95*		*56 - 136*		*11/22/21 23:04*	*1*
Toluene-d8 (Surr)	*101*		*78 - 122*		*11/22/21 23:04*	*1*
Dibromofluoromethane (Surr)	*112*		*73 - 120*		*11/22/21 23:04*	*1*

Client Sample ID: MW-76_111121
Lab Sample ID: 240-160089-3
Date Collected: 11/11/21 13:30
Matrix: Water
Date Received: 11/13/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/19/21 01:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*66 - 120*		*11/19/21 01:54*	*1*

Client Sample ID: MW-76_111121
Date Collected: 11/11/21 13:30
Date Received: 11/13/21 08:00

Lab Sample ID: 240-160089-3
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/23/21 17:58	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/23/21 17:58	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/23/21 17:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/23/21 17:58	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/23/21 17:58	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/23/21 17:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/23/21 17:58*	*1*
4-Bromofluorobenzene (Surr)	*88*		*56 - 136*		*11/23/21 17:58*	*1*
Toluene-d8 (Surr)	*93*		*78 - 122*		*11/23/21 17:58*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/23/21 17:58*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159536-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/22/2021 10:20:22 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159536-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159536-1

Job ID: 240-159536-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159536-1

Comments
No additional comments.

Receipt
The samples were received on 11/6/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.0º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159536-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159536-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159536-1	TRIP BLANK_40	Water	11/04/21 00:00	11/06/21 08:00
240-159536-2	MW-77_110421	Water	11/04/21 11:05	11/06/21 08:00
240-159536-3	MW-77S_110421	Water	11/04/21 12:00	11/06/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159536-1

Client Sample ID: TRIP BLANK_40 — Lab Sample ID: 240-159536-1

No Detections.

Client Sample ID: MW-77_110421 — Lab Sample ID: 240-159536-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	1.3		1.0	0.46	ug/L	1		8260B	Total/NA

Client Sample ID: MW-77S_110421 — Lab Sample ID: 240-159536-3

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159536-1

Client Sample ID: TRIP BLANK_40
Date Collected: 11/04/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159536-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 04:17	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 04:17	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 04:17	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 04:17	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 04:17	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 04:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*62 - 137*		*11/12/21 04:17*	*1*
4-Bromofluorobenzene (Surr)	*72*		*56 - 136*		*11/12/21 04:17*	*1*
Toluene-d8 (Surr)	*104*		*78 - 122*		*11/12/21 04:17*	*1*
Dibromofluoromethane (Surr)	*90*		*73 - 120*		*11/12/21 04:17*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159536-1

Client Sample ID: MW-77_110421
Date Collected: 11/04/21 11:05
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159536-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 20:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*11/12/21 20:52*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 04:39	1
cis-1,2-Dichloroethene	**1.3**		1.0	0.46	ug/L			11/12/21 04:39	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 04:39	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 04:39	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 04:39	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 04:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*		*11/12/21 04:39*	*1*
4-Bromofluorobenzene (Surr)	*83*		*56 - 136*		*11/12/21 04:39*	*1*
Toluene-d8 (Surr)	*110*		*78 - 122*		*11/12/21 04:39*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/12/21 04:39*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159536-1

Client Sample ID: MW-77S_110421
Date Collected: 11/04/21 12:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159536-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 21:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*11/12/21 21:16*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 03:58	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 03:58	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 03:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 03:58	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 03:58	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 03:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/13/21 03:58*	*1*
4-Bromofluorobenzene (Surr)	*79*		*56 - 136*		*11/13/21 03:58*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/13/21 03:58*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/13/21 03:58*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159536-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159536-1	TRIP BLANK_40	91	72	104	90
240-159536-2	MW-77_110421	100	83	110	99
240-159536-3	MW-77S_110421	99	79	108	99
240-159536-3 MS	MW-77S_110421	93	86	114	94
240-159536-3 MSD	MW-77S_110421	98	93	112	97
240-159539-B-5 MS	Matrix Spike	96	94	116	97
240-159539-B-5 MSD	Matrix Spike Duplicate	90	87	108	92
LCS 240-512565/4	Lab Control Sample	89	87	107	90
LCS 240-512748/4	Lab Control Sample	93	91	113	93
MB 240-512565/6	Method Blank	92	73	102	90
MB 240-512748/6	Method Blank	92	79	103	92

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159536-2	MW-77_110421	82
240-159536-3	MW-77S_110421	82
240-159543-G-3 MS	Matrix Spike	85
240-159543-O-3 MSD	Matrix Spike Duplicate	83
LCS 240-512758/4	Lab Control Sample	83
MB 240-512758/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512565/6
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 23:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 23:50	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 23:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 23:50	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 23:50	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 23:50	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/11/21 23:50*	*1*
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*11/11/21 23:50*	*1*
Toluene-d8 (Surr)	*102*		*78 - 122*		*11/11/21 23:50*	*1*
Dibromofluoromethane (Surr)	*90*		*73 - 120*		*11/11/21 23:50*	*1*

Lab Sample ID: LCS 240-512565/4
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.4		ug/L		104	63 - 134
cis-1,2-Dichloroethene	10.0	10.1		ug/L		101	77 - 123
Tetrachloroethene	10.0	10.6		ug/L		106	76 - 123
trans-1,2-Dichloroethene	10.0	10.1		ug/L		101	75 - 124
Trichloroethene	10.0	8.95		ug/L		90	70 - 122
Vinyl chloride	10.0	9.56		ug/L		96	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*107*		*78 - 122*
Dibromofluoromethane (Surr)	*90*		*73 - 120*

Lab Sample ID: 240-159539-B-5 MS
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25	U	250	224		ug/L		90	56 - 135
cis-1,2-Dichloroethene	43		250	285		ug/L		97	66 - 128
Tetrachloroethene	25	U	250	201		ug/L		80	62 - 131
trans-1,2-Dichloroethene	86		250	316		ug/L		92	56 - 136
Trichloroethene	830	F1	250	936	F1	ug/L		41	61 - 124
Vinyl chloride	25	U	250	246		ug/L		99	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*
Toluene-d8 (Surr)	*116*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159539-B-5 MS
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	97		73 - 120

Lab Sample ID: 240-159539-B-5 MSD
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	25	U	250	213		ug/L		85	56 - 135	5	26
cis-1,2-Dichloroethene	43		250	272		ug/L		92	66 - 128	5	14
Tetrachloroethene	25	U	250	210		ug/L		84	62 - 131	4	20
trans-1,2-Dichloroethene	86		250	297		ug/L		84	56 - 136	6	15
Trichloroethene	830	F1	250	885	F1	ug/L		21	61 - 124	6	15
Vinyl chloride	25	U	250	233		ug/L		93	43 - 157	6	24

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	90		62 - 137
4-Bromofluorobenzene (Surr)	87		56 - 136
Toluene-d8 (Surr)	108		78 - 122
Dibromofluoromethane (Surr)	92		73 - 120

Lab Sample ID: MB 240-512748/6
Matrix: Water
Analysis Batch: 512748

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 23:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 23:07	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 23:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 23:07	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 23:07	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 23:07	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	92		62 - 137		11/12/21 23:07	1
4-Bromofluorobenzene (Surr)	79		56 - 136		11/12/21 23:07	1
Toluene-d8 (Surr)	103		78 - 122		11/12/21 23:07	1
Dibromofluoromethane (Surr)	92		73 - 120		11/12/21 23:07	1

Lab Sample ID: LCS 240-512748/4
Matrix: Water
Analysis Batch: 512748

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.3		ug/L		103	63 - 134
cis-1,2-Dichloroethene	10.0	9.94		ug/L		99	77 - 123
Tetrachloroethene	10.0	10.8		ug/L		108	76 - 123
trans-1,2-Dichloroethene	10.0	10.1		ug/L		101	75 - 124
Trichloroethene	10.0	8.81		ug/L		88	70 - 122

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-512748/4
Matrix: Water
Analysis Batch: 512748

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Vinyl chloride			10.0	10.0		ug/L		100	60 - 144		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*91*		*56 - 136*
Toluene-d8 (Surr)	*113*		*78 - 122*
Dibromofluoromethane (Surr)	*93*		*73 - 120*

Lab Sample ID: 240-159536-3 MS
Matrix: Water
Analysis Batch: 512748

Client Sample ID: MW-77S_110421
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,1-Dichloroethene	1.0	U	10.0	9.26		ug/L		93	56 - 135		
cis-1,2-Dichloroethene	1.0	U	10.0	10.1		ug/L		101	66 - 128		
Tetrachloroethene	1.0	U	10.0	9.29		ug/L		93	62 - 131		
trans-1,2-Dichloroethene	1.0	U	10.0	9.49		ug/L		95	56 - 136		
Trichloroethene	1.0	U	10.0	7.71		ug/L		77	61 - 124		
Vinyl chloride	1.0	U	10.0	8.69		ug/L		87	43 - 157		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*86*		*56 - 136*
Toluene-d8 (Surr)	*114*		*78 - 122*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: 240-159536-3 MSD
Matrix: Water
Analysis Batch: 512748

Client Sample ID: MW-77S_110421
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.41		ug/L		94	56 - 135	2	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.89		ug/L		99	66 - 128	2	14
Tetrachloroethene	1.0	U	10.0	9.07		ug/L		91	62 - 131	2	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.73		ug/L		97	56 - 136	2	15
Trichloroethene	1.0	U	10.0	7.96		ug/L		80	61 - 124	3	15
Vinyl chloride	1.0	U	10.0	9.96		ug/L		100	43 - 157	14	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*
4-Bromofluorobenzene (Surr)	*93*		*56 - 136*
Toluene-d8 (Surr)	*112*		*78 - 122*
Dibromofluoromethane (Surr)	*97*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512758/5
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 16:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/12/21 16:51*	*1*

Lab Sample ID: LCS 240-512758/4
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	9.63		ug/L		96	80 - 122		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

Lab Sample ID: 240-159543-G-3 MS
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U F1	10.0	9.98		ug/L		100	51 - 153		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

Lab Sample ID: 240-159543-O-3 MSD
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.71		ug/L		97	51 - 153	3	16

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159536-1

GC/MS VOA

Analysis Batch: 512565

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159536-1	TRIP BLANK_40	Total/NA	Water	8260B	
240-159536-2	MW-77_110421	Total/NA	Water	8260B	
MB 240-512565/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512565/4	Lab Control Sample	Total/NA	Water	8260B	
240-159539-B-5 MS	Matrix Spike	Total/NA	Water	8260B	
240-159539-B-5 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 512748

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159536-3	MW-77S_110421	Total/NA	Water	8260B	
MB 240-512748/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512748/4	Lab Control Sample	Total/NA	Water	8260B	
240-159536-3 MS	MW-77S_110421	Total/NA	Water	8260B	
240-159536-3 MSD	MW-77S_110421	Total/NA	Water	8260B	

Analysis Batch: 512758

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159536-2	MW-77_110421	Total/NA	Water	8260B SIM	
240-159536-3	MW-77S_110421	Total/NA	Water	8260B SIM	
MB 240-512758/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512758/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159543-G-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159543-O-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159536-1

Client Sample ID: TRIP BLANK_40

Lab Sample ID: 240-159536-1
Matrix: Water
Date Collected: 11/04/21 00:00
Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512565	11/12/21 04:17	LEE	TAL CAN

Client Sample ID: MW-77_110421

Lab Sample ID: 240-159536-2
Matrix: Water
Date Collected: 11/04/21 11:05
Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512565	11/12/21 04:39	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512758	11/12/21 20:52	CS	TAL CAN

Client Sample ID: MW-77S_110421

Lab Sample ID: 240-159536-3
Matrix: Water
Date Collected: 11/04/21 12:00
Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512748	11/13/21 03:58	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512758	11/12/21 21:16	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159536-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Seth Turner	TAT if different from below: 10 day; 3 weeks / ✓ 2 weeks / 1 week / 2 days / 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM				Sample Specific Notes / Special Instructions:
TRIP BLANK_ 90	—	—		X						1					N	G	X	X	X	X	X	X	(W)				1 Trip Blank
MW-77_110421	11/04/21	1105		X						6					N	G	X	X	X	X	X	X	X				3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-77S_110421	11/4/21	1200		X						6					N	G	X	X	X	X	X	X	X				↓

240-159536 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; ✓ Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Seth Turner	Arcadis	11/4/21/1500	Novi cold storage	Arcadis	11/4/21/1500
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	ARCADIS	11/5/21/1435	[signature]	ETA	11/5/21 1435
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
[signature]	ETA	11/5/21 1445	M. [signature]	ETA	11/6/21 0800

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11/22/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 59536
Canton Facility

Client ARCADIS Site Name _____ Cooler unpacked by: Matthew Surma

Cooler Received on 11/6/21 Opened on 11/6/21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.9 °C Corrected Cooler Temp. 1.0 °C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# **HC157842**
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 0104201G	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page Samples processed by:

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

WI-NC-099

DATA VERIFICATION REPORT

November 22, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159536-1
Sample date: 2021-11-04
Report received by CADENA: 2021-11-22
Initial Data Verification completed by CADENA: 2021-11-22
Number of Samples:3
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

MS/MSD recovery outliers or sample duplicate RPD outliers were not determined using a client sample from this submittal for the test and QC batch noted so qualification was not required based on these sample-specific QC outliers:
GCMS VOC QC batch 512565.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, MS/MSD Recovery, MS/MSD RPD, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159536-1

		Sample Name:	TRIP BLANK_40				MW-77_110421				MW-77S_110421			
		Lab Sample ID:	2401595361				2401595362				2401595363			
		Sample Date:	11/4/2021				11/4/2021				11/4/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC													
OSW-8260B													
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	1.3	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim													
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

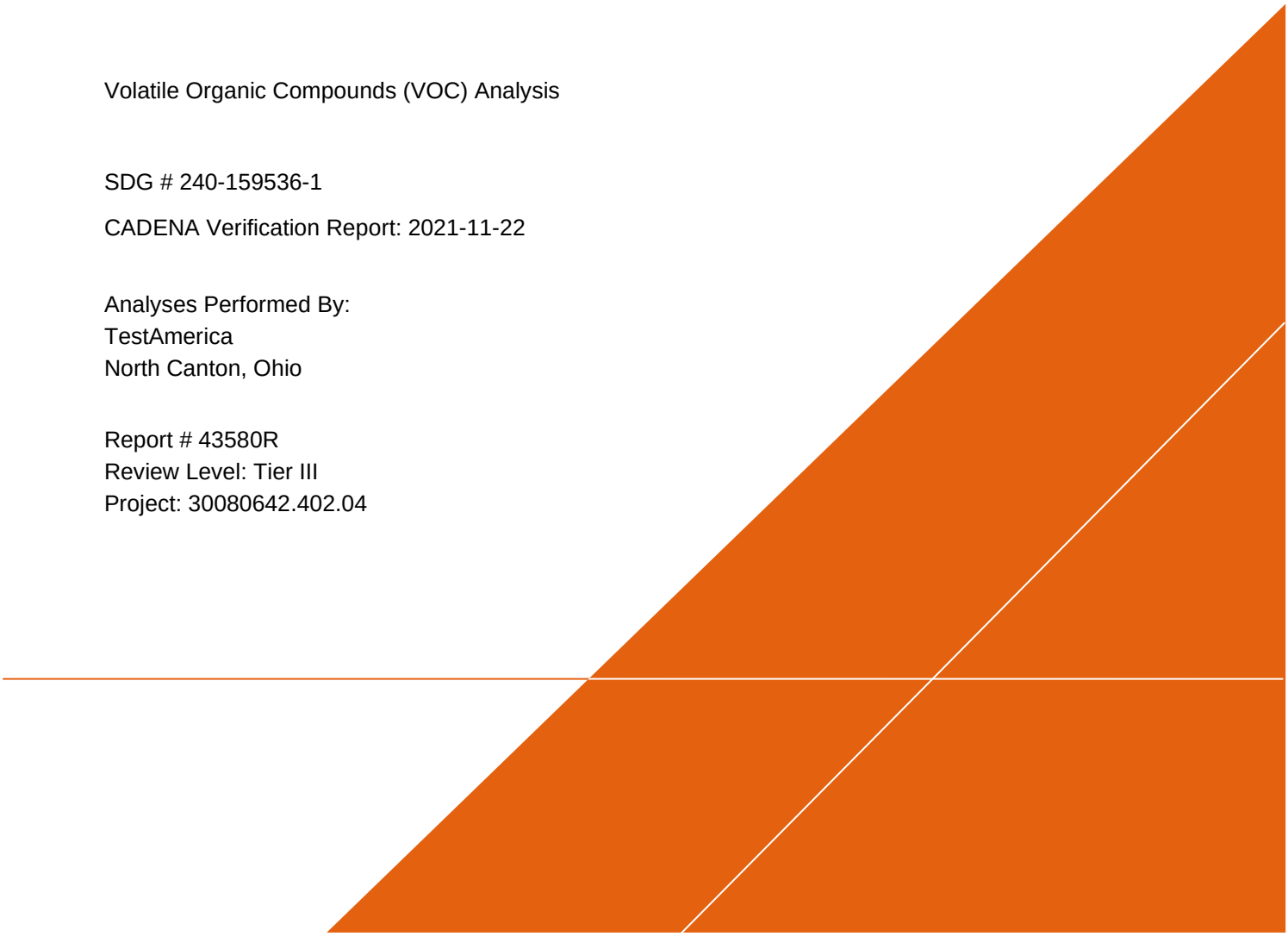
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159536-1

CADENA Verification Report: 2021-11-22

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43580R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159536-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_40	240-159536-1	Water	11/04/21		X	
MW-77_110421	240-159536-2	Water	11/04/21		X	X
MW-77S_110421	240-159536-3	Water	11/04/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE:

DATE: December 07, 2021

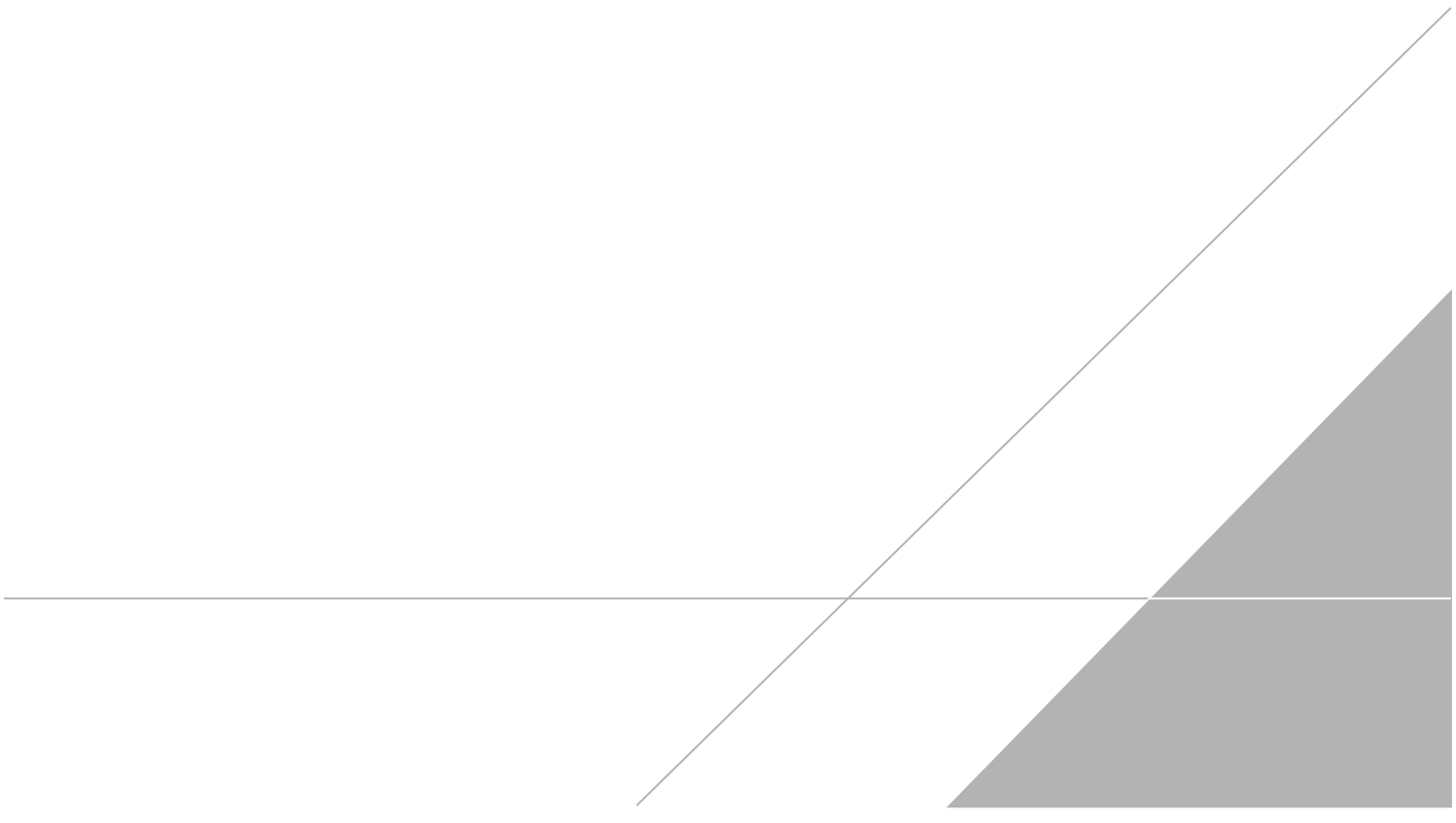
PEER REVIEW: Andrew Korycinski

DATE: December 8, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Seth Turner	TAT if different from below: 10 day; ✓ 2 weeks; 3 weeks; 1 week; 2 days; 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM				Sample Specific Notes / Special Instructions:
TRIP BLANK_ 90	—	—		X						1					N	G	X	X	X	X	X	X	⊗ (W)				1 Trip Blank
MW-77_110421	11/04/21	1105		X						6					N	G	X	X	X	X	X	X	X				3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-77S_110421	11/4/21	1200		X						6					N	G	X	X	X	X	X	X	X				↓

240-159536 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; ✓ Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	11/4/21/1500	Novi cold storage	Arcadis	11/4/21/1500
[signature]	ARCADIS	11/5/21/1435	[signature]	ETA	11/5/21 1435
[signature]	EA	11/5/21 1445	[signature]	ETA	11/6/21 0800

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Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159536-1

Client Sample ID: TRIP BLANK_40
Date Collected: 11/04/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159536-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 04:17	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 04:17	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 04:17	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 04:17	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 04:17	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 04:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*62 - 137*		*11/12/21 04:17*	*1*
4-Bromofluorobenzene (Surr)	*72*		*56 - 136*		*11/12/21 04:17*	*1*
Toluene-d8 (Surr)	*104*		*78 - 122*		*11/12/21 04:17*	*1*
Dibromofluoromethane (Surr)	*90*		*73 - 120*		*11/12/21 04:17*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159536-1

Client Sample ID: MW-77_110421
Date Collected: 11/04/21 11:05
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159536-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 20:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*11/12/21 20:52*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 04:39	1
cis-1,2-Dichloroethene	**1.3**		1.0	0.46	ug/L			11/12/21 04:39	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 04:39	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 04:39	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 04:39	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 04:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*		*11/12/21 04:39*	*1*
4-Bromofluorobenzene (Surr)	*83*		*56 - 136*		*11/12/21 04:39*	*1*
Toluene-d8 (Surr)	*110*		*78 - 122*		*11/12/21 04:39*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/12/21 04:39*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159536-1

Client Sample ID: MW-77S_110421
Date Collected: 11/04/21 12:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159536-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 21:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*11/12/21 21:16*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 03:58	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 03:58	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 03:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 03:58	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 03:58	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 03:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/13/21 03:58*	*1*
4-Bromofluorobenzene (Surr)	*79*		*56 - 136*		*11/13/21 03:58*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/13/21 03:58*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/13/21 03:58*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-160152-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
12/3/2021 3:51:13 PM

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Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160152-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F2	MS/MSD RPD exceeds control limits
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160152-1

Job ID: 240-160152-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-160152-1

Comments
No additional comments.

Receipt
The samples were received on 11/16/2021 10:15 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.9º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160152-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160152-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-160152-1	TRIP BLANK_123	Water	11/11/21 00:00	11/16/21 10:15
240-160152-2	MW-78_111121	Water	11/11/21 11:01	11/16/21 10:15
240-160152-3	MW-78S_111121	Water	11/11/21 11:51	11/16/21 10:15

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160152-1

Client Sample ID: TRIP BLANK_123 — Lab Sample ID: 240-160152-1

No Detections.

Client Sample ID: MW-78_111121 — Lab Sample ID: 240-160152-2

No Detections.

Client Sample ID: MW-78S_111121 — Lab Sample ID: 240-160152-3

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160152-1

Client Sample ID: TRIP BLANK_123
Date Collected: 11/11/21 00:00
Date Received: 11/16/21 10:15

Lab Sample ID: 240-160152-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 06:34	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 06:34	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 06:34	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 06:34	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 06:34	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 06:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*109*		*62 - 137*		*11/20/21 06:34*	*1*
4-Bromofluorobenzene (Surr)	*77*		*56 - 136*		*11/20/21 06:34*	*1*
Toluene-d8 (Surr)	*114*		*78 - 122*		*11/20/21 06:34*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/20/21 06:34*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160152-1

Client Sample ID: MW-78_111121
Date Collected: 11/11/21 11:01
Date Received: 11/16/21 10:15

Lab Sample ID: 240-160152-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/19/21 03:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*74*		*66 - 120*		*11/19/21 03:09*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 06:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 06:57	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 06:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 06:57	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 06:57	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 06:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*		*11/20/21 06:57*	*1*
4-Bromofluorobenzene (Surr)	*72*		*56 - 136*		*11/20/21 06:57*	*1*
Toluene-d8 (Surr)	*100*		*78 - 122*		*11/20/21 06:57*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/20/21 06:57*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160152-1

Client Sample ID: MW-78S_111121
Date Collected: 11/11/21 11:51
Date Received: 11/16/21 10:15

Lab Sample ID: 240-160152-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/19/21 03:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*76*		*66 - 120*		*11/19/21 03:34*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 07:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 07:19	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 07:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 07:19	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 07:19	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 07:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*		*11/20/21 07:19*	*1*
4-Bromofluorobenzene (Surr)	*69*		*56 - 136*		*11/20/21 07:19*	*1*
Toluene-d8 (Surr)	*105*		*78 - 122*		*11/20/21 07:19*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*11/20/21 07:19*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160152-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-160150-B-2 MS	Matrix Spike	99	85	110	90
240-160150-D-2 MSD	Matrix Spike Duplicate	104	88	122	96
240-160152-1	TRIP BLANK_123	109	77	114	101
240-160152-2	MW-78_111121	100	72	100	94
240-160152-3	MW-78S_111121	102	69	105	95
LCS 240-513905/4	Lab Control Sample	104	89	118	97
MB 240-513905/6	Method Blank	99	73	109	92

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159739-G-3 MS	Matrix Spike	74
240-159739-M-3 MSD	Matrix Spike Duplicate	75
240-160152-2	MW-78_111121	74
240-160152-3	MW-78S_111121	76
LCS 240-513700/4	Lab Control Sample	75
MB 240-513700/5	Method Blank	77

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513905/6
Matrix: Water
Analysis Batch: 513905

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 03:58	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 03:58	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 03:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 03:58	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 03:58	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 03:58	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/20/21 03:58*	*1*
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*11/20/21 03:58*	*1*
Toluene-d8 (Surr)	*109*		*78 - 122*		*11/20/21 03:58*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*11/20/21 03:58*	*1*

Lab Sample ID: LCS 240-513905/4
Matrix: Water
Analysis Batch: 513905

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.9		ug/L		109	63 - 134
cis-1,2-Dichloroethene	10.0	10.4		ug/L		104	77 - 123
Tetrachloroethene	10.0	10.3		ug/L		103	76 - 123
trans-1,2-Dichloroethene	10.0	10.6		ug/L		106	75 - 124
Trichloroethene	10.0	8.96		ug/L		90	70 - 122
Vinyl chloride	10.0	11.0		ug/L		110	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*104*		*62 - 137*
4-Bromofluorobenzene (Surr)	*89*		*56 - 136*
Toluene-d8 (Surr)	*118*		*78 - 122*
Dibromofluoromethane (Surr)	*97*		*73 - 120*

Lab Sample ID: 240-160150-B-2 MS
Matrix: Water
Analysis Batch: 513905

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	7.96		ug/L		80	56 - 135
cis-1,2-Dichloroethene	1.0	U F2	10.0	8.59		ug/L		86	66 - 128
Tetrachloroethene	1.0	U	10.0	7.18		ug/L		72	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	8.27		ug/L		83	56 - 136
Trichloroethene	1.0	U	10.0	6.70		ug/L		67	61 - 124
Vinyl chloride	1.0	U	10.0	8.91		ug/L		89	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*
Toluene-d8 (Surr)	*110*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-160150-B-2 MS
Matrix: Water
Analysis Batch: 513905

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*90*		*73 - 120*

Lab Sample ID: 240-160150-D-2 MSD
Matrix: Water
Analysis Batch: 513905

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.12		ug/L		91	56 - 135	14	26
cis-1,2-Dichloroethene	1.0	U F2	10.0	10.1	F2	ug/L		101	66 - 128	16	14
Tetrachloroethene	1.0	U	10.0	8.59		ug/L		86	62 - 131	18	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.32		ug/L		93	56 - 136	12	15
Trichloroethene	1.0	U	10.0	7.73		ug/L		77	61 - 124	14	15
Vinyl chloride	1.0	U	10.0	9.29		ug/L		93	43 - 157	4	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*104*		*62 - 137*
4-Bromofluorobenzene (Surr)	*88*		*56 - 136*
Toluene-d8 (Surr)	*122*		*78 - 122*
Dibromofluoromethane (Surr)	*96*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513700/5
Matrix: Water
Analysis Batch: 513700

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 19:41	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*		*11/18/21 19:41*	*1*

Lab Sample ID: LCS 240-513700/4
Matrix: Water
Analysis Batch: 513700

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.4		ug/L		104	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*

Lab Sample ID: 240-159739-G-3 MS
Matrix: Water
Analysis Batch: 513700

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.4		ug/L		104	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*74*		*66 - 120*

Lab Sample ID: 240-159739-M-3 MSD
Matrix: Water
Analysis Batch: 513700

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153	2	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160152-1

GC/MS VOA

Analysis Batch: 513700

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-160152-2	MW-78_111121	Total/NA	Water	8260B SIM	
240-160152-3	MW-78S_111121	Total/NA	Water	8260B SIM	
MB 240-513700/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513700/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159739-G-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159739-M-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513905

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-160152-1	TRIP BLANK_123	Total/NA	Water	8260B	
240-160152-2	MW-78_111121	Total/NA	Water	8260B	
240-160152-3	MW-78S_111121	Total/NA	Water	8260B	
MB 240-513905/6	Method Blank	Total/NA	Water	8260B	
LCS 240-513905/4	Lab Control Sample	Total/NA	Water	8260B	
240-160150-B-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-160150-D-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160152-1

Client Sample ID: TRIP BLANK_123
Lab Sample ID: 240-160152-1
Date Collected: 11/11/21 00:00
Matrix: Water
Date Received: 11/16/21 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513905	11/20/21 06:34	LEE	TAL CAN

Client Sample ID: MW-78_111121
Lab Sample ID: 240-160152-2
Date Collected: 11/11/21 11:01
Matrix: Water
Date Received: 11/16/21 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513905	11/20/21 06:57	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513700	11/19/21 03:09	CS	TAL CAN

Client Sample ID: MW-78S_111121
Lab Sample ID: 240-160152-3
Date Collected: 11/11/21 11:51
Matrix: Water
Date Received: 11/16/21 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513905	11/20/21 07:19	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513700	11/19/21 03:34	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160152-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive Suite 200 / Brighton MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Gary Schafer	TAT if different from below: 10 day (3 weeks, 2 weeks, 1 week, 2 days, 1 day)		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No.
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac/ NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions
TRIP BLANK_123	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-78_111121	11/11/21	11:01		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-78S_111121	11/11/21	11:51		X						6					N	G	X	X	X	X	X	X	X	

240-160152 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; ✓ Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco com Cadena #E203631
Level IV Reporting requested

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
Gary Schafer	Arcadis	11/13/21 1530	Novi cold storage	Arcadis	11/13/21 1530
Relinquished by	Company	Date/Time	Received by	Company	Date/Time
	ARCADIS	11/15/21		EXA	11/15/21
Relinquished by	Company	Date/Time	Received in Laboratory by	Company	Date/Time
	EXA	11/15/21	Tammy Page	ETA	11-16-21 1015

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12/3/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 160152
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Tammy Boyer

Cooler Received on 11-16-21 Opened on 11-16-21

FedEx. 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # 1A Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.8 °C Corrected Cooler Temp 0.9 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2 Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3 Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6 Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		RB
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC157842
14. Were VOAs on the COC?	Yes	No
15 Were air bubbles >6 mm in any VOA vials? ● ← Larger than this	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 60358	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

NO SIM on TB per Corrected COC. mm 11/16/21

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired

Sample(s) _____ were received in a broken container

Sample(s) _____ were received with bubble >6 mm in diameter (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved _____ Preservative(s) added/Lot number(s). _____

VOA Sample Preservation - Date/Time VOAs Frozen. _____



11:30 B
1774
11 16

eurofins

Part # 159469-434 MTW EXP 07/22

ORIGIN ID:DEOA (810) 229-2763
SHIPPING DEPARTMENT
EUROFINS TESTAMERICA
10448 CITATION DRIVE
SUITE 200
BRIGHTON, MI 48116
UNITED STATES US

SHIP DATE: 15NOV21
ACTWGT: 49.15 LB
CAD: 0183192/CAFE3507

BILL RECIPIENT

TO ATTN: SAMPLE RECEVING
EUROFINS TEST AMERICA NORTH CANTON
4101 SHUFFEL DRIVE NW

NORTH CANTON OH 44720
(330) 497-9396
INV:
PO:
REF:
DEPT:

570C2/9A7E/6F4D

FedEx Express

E

J211020121101uv

TRK# 0201 4506 9518 1774

TUE - 16 NOV 11:30A
PRIORITY OVERNIGHT

64 PHDA

44720
OH-US CLE

DATA VERIFICATION REPORT

December 04, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 160152-1
Sample date: 2021-11-11
Report received by CADENA: 2021-12-03
Initial Data Verification completed by CADENA: 2021-12-04
Number of Samples:3
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch MS/MSD recovery outliers were not determined using a client sample so qualification was not required based on these sample-specific QC outliers.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 160152-1

		Sample Name:	TRIP BLANK_123				MW-78_111121				MW-78S_111121			
		Lab Sample ID:	2401601521				2401601522				2401601523			
		Sample Date:	11/11/2021				11/11/2021				11/11/2021			
Analyte	Cas No.		Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC														
OSW-8260B														
1,1-Dichloroethene	75-35-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim														
1,4-Dioxane	123-91-1						ND	2.0	ug/l	---	ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

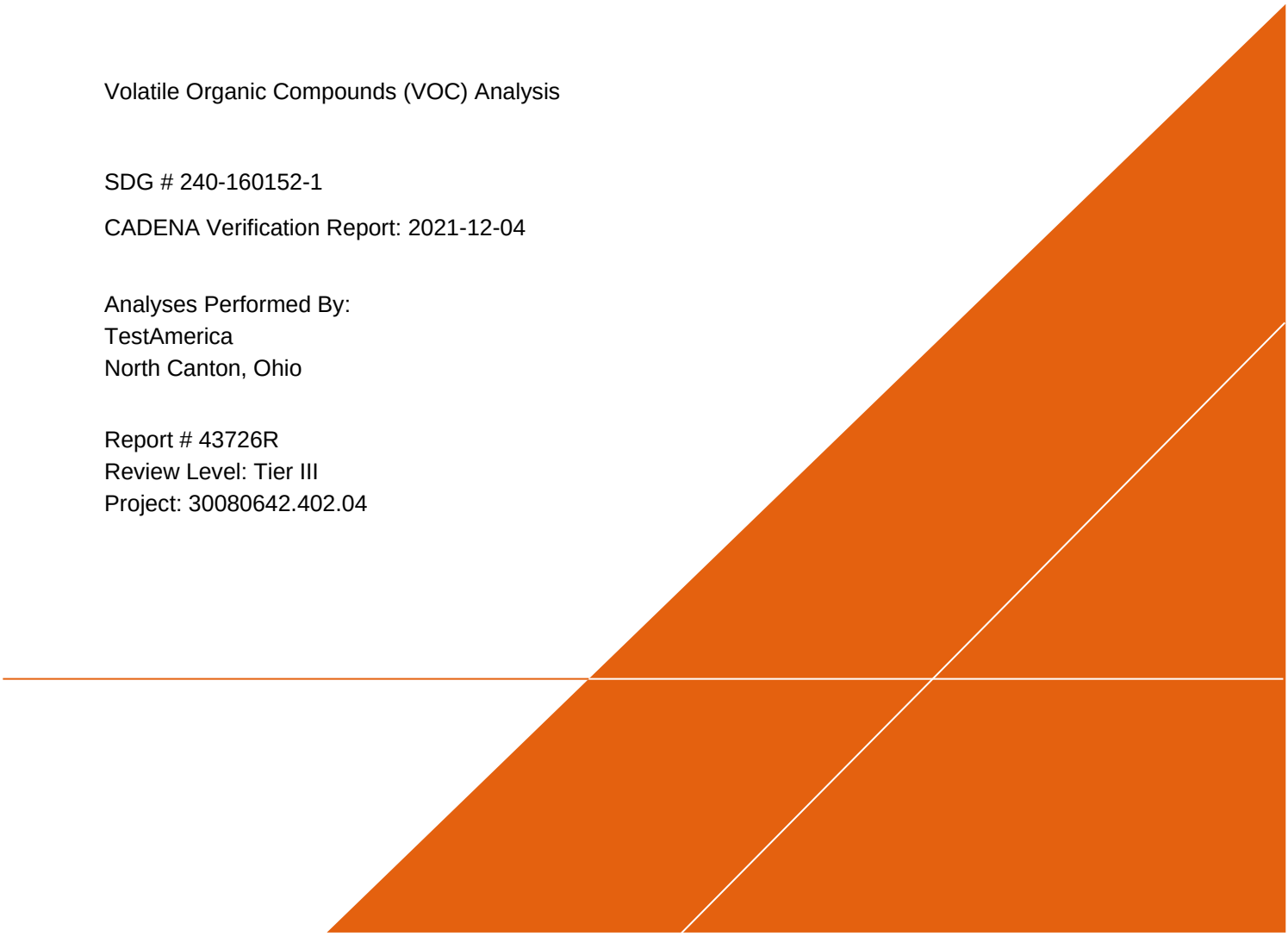
Volatile Organic Compounds (VOC) Analysis

SDG # 240-160152-1

CADENA Verification Report: 2021-12-04

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43726R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-160152-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_123	240-160152-1	Water	11/11/21		X	
MW-78_111121	240-160152-2	Water	11/11/21		X	X
MW-78S_111121	240-160152-3	Water	11/11/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive Suite 200 / Brighton MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Gary Schafer	TAT if different from below: 10 day (3 weeks, 2 weeks, 1 week, 2 days, 1 day)		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No.
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions
TRIP BLANK_123	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-78_111121	11/11/21	11:01		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-78S_111121	11/11/21	11:51		X						6					N	G	X	X	X	X	X	X	X	

240-160152 Chain of Custody

Possible Hazard Identification: Non-Hazard, Flammable, Skin Irritant, Poison B, Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client, Disposal By Lab, Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com Cadena #E203631
Level IV Reporting requested

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
Gary Schafer	Arcadis	11/13/21 1530	Nori cold storage	Arcadis	11/13/21 1530
[signature]	ARCADIS	11/15/21 /	[signature]	EXA	11/15/21
[signature]	EXA	11/15/21	Received in Laboratory by: [signature]	ETA	11-16-21 1015

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Client Sample ID: TRIP BLANK_123
Lab Sample ID: 240-160152-1
Date Collected: 11/11/21 00:00
Matrix: Water
Date Received: 11/16/21 10:15

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 06:34	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 06:34	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 06:34	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 06:34	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 06:34	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 06:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*109*		*62 - 137*		*11/20/21 06:34*	*1*
4-Bromofluorobenzene (Surr)	*77*		*56 - 136*		*11/20/21 06:34*	*1*
Toluene-d8 (Surr)	*114*		*78 - 122*		*11/20/21 06:34*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/20/21 06:34*	*1*

Client Sample ID: MW-78_111121
Lab Sample ID: 240-160152-2
Date Collected: 11/11/21 11:01
Matrix: Water
Date Received: 11/16/21 10:15

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/19/21 03:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*74*		*66 - 120*		*11/19/21 03:09*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 06:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 06:57	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 06:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 06:57	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 06:57	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 06:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*		*11/20/21 06:57*	*1*
4-Bromofluorobenzene (Surr)	*72*		*56 - 136*		*11/20/21 06:57*	*1*
Toluene-d8 (Surr)	*100*		*78 - 122*		*11/20/21 06:57*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/20/21 06:57*	*1*

Client Sample ID: MW-78S_111121
Lab Sample ID: 240-160152-3
Date Collected: 11/11/21 11:51
Matrix: Water
Date Received: 11/16/21 10:15

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/19/21 03:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*76*		*66 - 120*		*11/19/21 03:34*	*1*

Client Sample ID: MW-78S_111121
Lab Sample ID: 240-160152-3

Date Collected: 11/11/21 11:51
Matrix: Water
Date Received: 11/16/21 10:15

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 07:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 07:19	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 07:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 07:19	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 07:19	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 07:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*		*11/20/21 07:19*	*1*
4-Bromofluorobenzene (Surr)	*69*		*56 - 136*		*11/20/21 07:19*	*1*
Toluene-d8 (Surr)	*105*		*78 - 122*		*11/20/21 07:19*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*11/20/21 07:19*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159636-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/23/2021 10:39:48 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159636-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159636-1

Job ID: 240-159636-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159636-1

Comments
No additional comments.

Receipt
The samples were received on 11/9/2021 10:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 3.7º C and 3.8º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159636-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159636-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159636-1	TRIP BLANK_62	Water	11/05/21 00:00	11/09/21 10:00
240-159636-2	MW-141S_110521	Water	11/05/21 08:50	11/09/21 10:00
240-159636-3	MW-139S_110521	Water	11/05/21 13:40	11/09/21 10:00
240-159636-4	MW-140S_110521	Water	11/05/21 12:45	11/09/21 10:00
240-159636-5	MW-79SR_110521	Water	11/05/21 11:35	11/09/21 10:00
240-159636-6	MW-79D_110521	Water	11/05/21 10:35	11/09/21 10:00
240-159636-7	DUP-13	Water	11/05/21 00:00	11/09/21 10:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159636-1

Client Sample ID: TRIP BLANK_62 — Lab Sample ID: 240-159636-1

No Detections.

Client Sample ID: MW-141S_110521 — Lab Sample ID: 240-159636-2

No Detections.

Client Sample ID: MW-139S_110521 — Lab Sample ID: 240-159636-3

No Detections.

Client Sample ID: MW-140S_110521 — Lab Sample ID: 240-159636-4

No Detections.

Client Sample ID: MW-79SR_110521 — Lab Sample ID: 240-159636-5

No Detections.

Client Sample ID: MW-79D_110521 — Lab Sample ID: 240-159636-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	2.8		1.0	0.45	ug/L	1		8260B	Total/NA

Client Sample ID: DUP-13 — Lab Sample ID: 240-159636-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	1.6	J	2.0	0.86	ug/L	1		8260B SIM	Total/NA
Vinyl chloride	2.4		1.0	0.45	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159636-1

Client Sample ID: TRIP BLANK_62

Date Collected: 11/05/21 00:00
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159636-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 18:02	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 18:02	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 18:02	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 18:02	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 18:02	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 18:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*62 - 137*		*11/16/21 18:02*	*1*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*		*11/16/21 18:02*	*1*
Toluene-d8 (Surr)	*93*		*78 - 122*		*11/16/21 18:02*	*1*
Dibromofluoromethane (Surr)	*104*		*73 - 120*		*11/16/21 18:02*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159636-1

Client Sample ID: MW-141S_110521
Date Collected: 11/05/21 08:50
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159636-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U F1	2.0	0.86	ug/L			11/17/21 18:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*		*11/17/21 18:31*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 21:59	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 21:59	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 21:59	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 21:59	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 21:59	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 21:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*		*11/16/21 21:59*	*1*
4-Bromofluorobenzene (Surr)	*89*		*56 - 136*		*11/16/21 21:59*	*1*
Toluene-d8 (Surr)	*99*		*78 - 122*		*11/16/21 21:59*	*1*
Dibromofluoromethane (Surr)	*113*		*73 - 120*		*11/16/21 21:59*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159636-1

Client Sample ID: MW-139S_110521
Date Collected: 11/05/21 13:40
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159636-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 02:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/17/21 02:10*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 21:35	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 21:35	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 21:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 21:35	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 21:35	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 21:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*		*11/16/21 21:35*	*1*
4-Bromofluorobenzene (Surr)	*89*		*56 - 136*		*11/16/21 21:35*	*1*
Toluene-d8 (Surr)	*101*		*78 - 122*		*11/16/21 21:35*	*1*
Dibromofluoromethane (Surr)	*113*		*73 - 120*		*11/16/21 21:35*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159636-1

Client Sample ID: MW-140S_110521
Date Collected: 11/05/21 12:45
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159636-4
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 02:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/17/21 02:34*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 19:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 19:22	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 19:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 19:22	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 19:22	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 19:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*62 - 137*		*11/17/21 19:22*	*1*
4-Bromofluorobenzene (Surr)	*88*		*56 - 136*		*11/17/21 19:22*	*1*
Toluene-d8 (Surr)	*98*		*78 - 122*		*11/17/21 19:22*	*1*
Dibromofluoromethane (Surr)	*105*		*73 - 120*		*11/17/21 19:22*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159636-1

Client Sample ID: MW-79SR_110521
Date Collected: 11/05/21 11:35
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159636-5
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 02:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*		*11/17/21 02:58*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 19:45	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 19:45	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 19:45	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 19:45	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 19:45	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 19:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/17/21 19:45*	*1*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*		*11/17/21 19:45*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*11/17/21 19:45*	*1*
Dibromofluoromethane (Surr)	*105*		*73 - 120*		*11/17/21 19:45*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159636-1

Client Sample ID: MW-79D_110521
Date Collected: 11/05/21 10:35
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159636-6
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 03:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/17/21 03:22*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 20:09	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 20:09	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 20:09	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 20:09	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 20:09	1
Vinyl chloride	**2.8**		1.0	0.45	ug/L			11/17/21 20:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*		*11/17/21 20:09*	*1*
4-Bromofluorobenzene (Surr)	*91*		*56 - 136*		*11/17/21 20:09*	*1*
Toluene-d8 (Surr)	*98*		*78 - 122*		*11/17/21 20:09*	*1*
Dibromofluoromethane (Surr)	*110*		*73 - 120*		*11/17/21 20:09*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159636-1

Client Sample ID: DUP-13
Date Collected: 11/05/21 00:00
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159636-7
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**1.6**	**J**	2.0	0.86	ug/L			11/17/21 03:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/17/21 03:46*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 20:33	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 20:33	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 20:33	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 20:33	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 20:33	1
Vinyl chloride	**2.4**		1.0	0.45	ug/L			11/17/21 20:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*		*11/17/21 20:33*	*1*
4-Bromofluorobenzene (Surr)	*89*		*56 - 136*		*11/17/21 20:33*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*11/17/21 20:33*	*1*
Dibromofluoromethane (Surr)	*110*		*73 - 120*		*11/17/21 20:33*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159636-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159636-1	TRIP BLANK_62	95	84	93	104
240-159636-2	MW-141S_110521	102	89	99	113
240-159636-2 MS	MW-141S-MS_110521	93	93	102	105
240-159636-2 MSD	MW-141S-MSD_110521	93	94	103	105
240-159636-3	MW-139S_110521	103	89	101	113
240-159636-4	MW-140S_110521	95	88	98	105
240-159636-5	MW-79SR_110521	93	87	95	105
240-159636-6	MW-79D_110521	98	91	98	110
240-159636-7	DUP-13	98	89	95	110
240-160104-A-1 MS	Matrix Spike	89	90	100	100
240-160104-A-1 MSD	Matrix Spike Duplicate	86	91	101	99
LCS 240-513208/5	Lab Control Sample	86	91	100	101
LCS 240-513357/12	Lab Control Sample	93	92	100	104
MB 240-513208/8	Method Blank	91	87	98	108
MB 240-513357/8	Method Blank	101	91	99	115

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159546-G-2 MS	Matrix Spike	82
240-159546-M-2 MSD	Matrix Spike Duplicate	85
240-159636-2	MW-141S_110521	77
240-159636-2 MS	MW-141S-MS_110521	77
240-159636-2 MSD	MW-141S-MSD_110521	77
240-159636-3	MW-139S_110521	85
240-159636-4	MW-140S_110521	84
240-159636-5	MW-79SR_110521	87
240-159636-6	MW-79D_110521	85
240-159636-7	DUP-13	84
LCS 240-513286/4	Lab Control Sample	82
LCS 240-513479/4	Lab Control Sample	78
MB 240-513286/5	Method Blank	85
MB 240-513479/5	Method Blank	77

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513208/8
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 14:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 14:06	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 14:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 14:06	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 14:06	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 14:06	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*62 - 137*		*11/16/21 14:06*	*1*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*		*11/16/21 14:06*	*1*
Toluene-d8 (Surr)	*98*		*78 - 122*		*11/16/21 14:06*	*1*
Dibromofluoromethane (Surr)	*108*		*73 - 120*		*11/16/21 14:06*	*1*

Lab Sample ID: LCS 240-513208/5
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	28.3		ug/L		113	63 - 134
cis-1,2-Dichloroethene	25.0	26.1		ug/L		104	77 - 123
Tetrachloroethene	25.0	29.3		ug/L		117	76 - 123
trans-1,2-Dichloroethene	25.0	27.4		ug/L		110	75 - 124
Trichloroethene	25.0	27.4		ug/L		110	70 - 122
Vinyl chloride	25.0	24.0		ug/L		96	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*
4-Bromofluorobenzene (Surr)	*91*		*56 - 136*
Toluene-d8 (Surr)	*100*		*78 - 122*
Dibromofluoromethane (Surr)	*101*		*73 - 120*

Lab Sample ID: 240-159636-2 MS
Matrix: Water
Analysis Batch: 513208

Client Sample ID: MW-141S-MS_110521
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	25.0	25.8		ug/L		103	56 - 135
cis-1,2-Dichloroethene	1.0	U	25.0	24.8		ug/L		99	66 - 128
Tetrachloroethene	1.0	U	25.0	28.9		ug/L		116	62 - 131
trans-1,2-Dichloroethene	1.0	U	25.0	25.3		ug/L		101	56 - 136
Trichloroethene	1.0	U	25.0	25.4		ug/L		101	61 - 124
Vinyl chloride	1.0	U	25.0	22.2		ug/L		89	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*93*		*56 - 136*
Toluene-d8 (Surr)	*102*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159636-2 MS
Matrix: Water
Analysis Batch: 513208

Client Sample ID: MW-141S-MS_110521
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*105*		*73 - 120*

Lab Sample ID: 240-159636-2 MSD
Matrix: Water
Analysis Batch: 513208

Client Sample ID: MW-141S-MSD_110521
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	25.0	25.9		ug/L		104	56 - 135	0	26
cis-1,2-Dichloroethene	1.0	U	25.0	25.0		ug/L		100	66 - 128	1	14
Tetrachloroethene	1.0	U	25.0	29.5		ug/L		118	62 - 131	2	20
trans-1,2-Dichloroethene	1.0	U	25.0	25.1		ug/L		100	56 - 136	1	15
Trichloroethene	1.0	U	25.0	25.3		ug/L		101	61 - 124	0	15
Vinyl chloride	1.0	U	25.0	22.3		ug/L		89	43 - 157	1	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*
Toluene-d8 (Surr)	*103*		*78 - 122*
Dibromofluoromethane (Surr)	*105*		*73 - 120*

Lab Sample ID: MB 240-513357/8
Matrix: Water
Analysis Batch: 513357

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 14:12	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 14:12	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 14:12	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 14:12	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 14:12	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 14:12	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*62 - 137*		*11/17/21 14:12*	*1*
4-Bromofluorobenzene (Surr)	*91*		*56 - 136*		*11/17/21 14:12*	*1*
Toluene-d8 (Surr)	*99*		*78 - 122*		*11/17/21 14:12*	*1*
Dibromofluoromethane (Surr)	*115*		*73 - 120*		*11/17/21 14:12*	*1*

Lab Sample ID: LCS 240-513357/12
Matrix: Water
Analysis Batch: 513357

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	29.1		ug/L		116	63 - 134
cis-1,2-Dichloroethene	25.0	28.2		ug/L		113	77 - 123
Tetrachloroethene	25.0	30.5		ug/L		122	76 - 123
trans-1,2-Dichloroethene	25.0	28.7		ug/L		115	75 - 124
Trichloroethene	25.0	29.7		ug/L		119	70 - 122

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-513357/12
Matrix: Water
Analysis Batch: 513357

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Vinyl chloride			25.0	25.2		ug/L		101	60 - 144		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*92*		*56 - 136*
Toluene-d8 (Surr)	*100*		*78 - 122*
Dibromofluoromethane (Surr)	*104*		*73 - 120*

Lab Sample ID: 240-160104-A-1 MS
Matrix: Water
Analysis Batch: 513357

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,1-Dichloroethene	40	U	1000	1170		ug/L		117	56 - 135		
cis-1,2-Dichloroethene	40	U	1000	1100		ug/L		110	66 - 128		
Tetrachloroethene	40	U	1000	1220		ug/L		122	62 - 131		
trans-1,2-Dichloroethene	40	U	1000	1110		ug/L		111	56 - 136		
Trichloroethene	40	U	1000	1140		ug/L		114	61 - 124		
Vinyl chloride	110		1000	1070		ug/L		96	43 - 157		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*62 - 137*
4-Bromofluorobenzene (Surr)	*90*		*56 - 136*
Toluene-d8 (Surr)	*100*		*78 - 122*
Dibromofluoromethane (Surr)	*100*		*73 - 120*

Lab Sample ID: 240-160104-A-1 MSD
Matrix: Water
Analysis Batch: 513357

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	40	U	1000	1170		ug/L		117	56 - 135	1	26
cis-1,2-Dichloroethene	40	U	1000	1080		ug/L		108	66 - 128	2	14
Tetrachloroethene	40	U	1000	1240		ug/L		124	62 - 131	2	20
trans-1,2-Dichloroethene	40	U	1000	1100		ug/L		110	56 - 136	1	15
Trichloroethene	40	U	1000	1130		ug/L		113	61 - 124	1	15
Vinyl chloride	110		1000	1080		ug/L		97	43 - 157	1	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*
4-Bromofluorobenzene (Surr)	*91*		*56 - 136*
Toluene-d8 (Surr)	*101*		*78 - 122*
Dibromofluoromethane (Surr)	*99*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513286/5
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/16/21 19:44	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/16/21 19:44*	*1*

Lab Sample ID: LCS 240-513286/4
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	9.78		ug/L		98	80 - 122		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159546-G-2 MS
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U F1	10.0	11.0		ug/L		110	51 - 153		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159546-M-2 MSD
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.83		ug/L		98	51 - 153	11	16

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

Lab Sample ID: MB 240-513479/5
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 17:41	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*		*11/17/21 17:41*	*1*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-513479/4
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	11.9		ug/L		119	80 - 122		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*

Lab Sample ID: 240-159636-2 MS
Matrix: Water
Analysis Batch: 513479

Client Sample ID: MW-141S-MS_110521
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

Lab Sample ID: 240-159636-2 MSD
Matrix: Water
Analysis Batch: 513479

Client Sample ID: MW-141S-MSD_110521
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153	0	16

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159636-1

GC/MS VOA

Analysis Batch: 513208

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159636-1	TRIP BLANK_62	Total/NA	Water	8260B	
240-159636-2	MW-141S_110521	Total/NA	Water	8260B	
240-159636-3	MW-139S_110521	Total/NA	Water	8260B	
MB 240-513208/8	Method Blank	Total/NA	Water	8260B	
LCS 240-513208/5	Lab Control Sample	Total/NA	Water	8260B	
240-159636-2 MS	MW-141S-MS_110521	Total/NA	Water	8260B	
240-159636-2 MSD	MW-141S-MSD_110521	Total/NA	Water	8260B	

Analysis Batch: 513286

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159636-3	MW-139S_110521	Total/NA	Water	8260B SIM	
240-159636-4	MW-140S_110521	Total/NA	Water	8260B SIM	
240-159636-5	MW-79SR_110521	Total/NA	Water	8260B SIM	
240-159636-6	MW-79D_110521	Total/NA	Water	8260B SIM	
240-159636-7	DUP-13	Total/NA	Water	8260B SIM	
MB 240-513286/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513286/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159546-G-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159546-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513357

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159636-4	MW-140S_110521	Total/NA	Water	8260B	
240-159636-5	MW-79SR_110521	Total/NA	Water	8260B	
240-159636-6	MW-79D_110521	Total/NA	Water	8260B	
240-159636-7	DUP-13	Total/NA	Water	8260B	
MB 240-513357/8	Method Blank	Total/NA	Water	8260B	
LCS 240-513357/12	Lab Control Sample	Total/NA	Water	8260B	
240-160104-A-1 MS	Matrix Spike	Total/NA	Water	8260B	
240-160104-A-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 513479

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159636-2	MW-141S_110521	Total/NA	Water	8260B SIM	
MB 240-513479/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513479/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159636-2 MS	MW-141S-MS_110521	Total/NA	Water	8260B SIM	
240-159636-2 MSD	MW-141S-MSD_110521	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159636-1

Client Sample ID: TRIP BLANK_62
Lab Sample ID: 240-159636-1
Date Collected: 11/05/21 00:00
Matrix: Water
Date Received: 11/09/21 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513208	11/16/21 18:02	SAM	TAL CAN

Client Sample ID: MW-141S_110521
Lab Sample ID: 240-159636-2
Date Collected: 11/05/21 08:50
Matrix: Water
Date Received: 11/09/21 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513208	11/16/21 21:59	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	513479	11/17/21 18:31	CS	TAL CAN

Client Sample ID: MW-139S_110521
Lab Sample ID: 240-159636-3
Date Collected: 11/05/21 13:40
Matrix: Water
Date Received: 11/09/21 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513208	11/16/21 21:35	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	513286	11/17/21 02:10	CS	TAL CAN

Client Sample ID: MW-140S_110521
Lab Sample ID: 240-159636-4
Date Collected: 11/05/21 12:45
Matrix: Water
Date Received: 11/09/21 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513357	11/17/21 19:22	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	513286	11/17/21 02:34	CS	TAL CAN

Client Sample ID: MW-79SR_110521
Lab Sample ID: 240-159636-5
Date Collected: 11/05/21 11:35
Matrix: Water
Date Received: 11/09/21 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513357	11/17/21 19:45	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	513286	11/17/21 02:58	CS	TAL CAN

Client Sample ID: MW-79D_110521
Lab Sample ID: 240-159636-6
Date Collected: 11/05/21 10:35
Matrix: Water
Date Received: 11/09/21 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513357	11/17/21 20:09	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	513286	11/17/21 03:22	CS	TAL CAN

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159636-1

Client Sample ID: DUP-13

Date Collected: 11/05/21 00:00
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159636-7

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513357	11/17/21 20:33	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	513286	11/17/21 03:46	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159636-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

MICHIGAN 190 — TestAmerica — THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Seth Turner	TAT if different from below: ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:	10 day		Lab sampling:
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac / NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_62	---	---		X						1							X	X	X	X	X	X	(ow)	1 Trip Blank
MW-14S_110521	11/5/21	850		X						6					N	G								3 VOAs for 8260B
MW-14S-MS_110521	11/5/21	850		X						6					N	G								3 VOAs for 8260B SIM
MW-14S-MSD_110521	11/5/21	850		X						6					N	G								RUN MS/MSD
MW-13S_110521	11/5/21	1340		X						6					N	G	X	X	X	X	X	X	X	RUN MS/MSD
MW-14OS_110521	11/5/21	1245		X						6					N	G	X	X	X	X	X	X	X	
MW-79SR_110521	11/5/21	1135		X						6					N	G	X	X	X	X	X	X	X	
MW-79D_110521	11/5/21	1035		X						6					N	G	X	X	X	X	X	X	X	
DUP-13	11/5/21	—		X						6					N	G	X	X	X	X	X	X	X	

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 mo): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalla@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

240-159636 Chain of Custody

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Seth Turner	Arcadis	11/5/21 / 1600	Novi Cold Storage	Arcadis	11/5/21/1600
[signature]	ARCADIS	11/8/21 / 1200	[signature]	ETA	11/8/21 / 1200
[signature]	ETA	11/8/21	Received in Laboratory by: [signature]	ETA	11-9-21 1000

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 159436
Canton Facility

Client ARCADIS Site Name _____ Cooler unpacked by: Tammy Dyer

Cooler Received on 11-9-21 Opened on 11-9-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 2	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?	Yes	No
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC157842
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 60358	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

11/9/21 11/11/21

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

TB is not logged for SIM ~~due to insufficient volume.~~
per corrected COC. 11/11/21 ~~11-9-21~~

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

Login # : 159636

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form				
Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
(TA) Client Box Other	(IR-14) IR-15	3.6	3.7	(Wet Ice) Blue Ice Dry Ice Water None
(TA) Client Box Other	(IR-14) IR-15	3.7	3.8	(Wet Ice) Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice

DATA VERIFICATION REPORT

November 23, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159636-1
Sample date: 2021-11-05
Report received by CADENA: 2021-11-23
Initial Data Verification completed by CADENA: 2021-11-23
Number of Samples: 7
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

NOTE: 1,4-dioxane F1 flag assigned to sample -002 in laboratory report was not supported by the batch QC data so flag was not assigned to field data as part of validation review.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, MS/MSD Recovery, MS/MSD RPD, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159636-1

		Sample Name:	TRIP BLANK_62				MW-141S_110521				MW-139S_110521				MW-140S_110521				MW-79SR_110521				MW-79D_110521				DUP-13			
		Lab Sample ID:	2401596361				2401596362				2401596363				2401596364				2401596365				2401596366				2401596367			
		Sample Date:	11/5/2021				11/5/2021				11/5/2021				11/5/2021				11/5/2021				11/5/2021				11/5/2021			
Analyte	Cas No.		Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC																														
OSW-8260B																														
1,1-Dichloroethene	75-35-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	2.8	1.0	ug/l	---	2.4	1.0	ug/l	---
OSW-8260BBSim																														
1,4-Dioxane	123-91-1						ND	2.0	ug/l	---	ND	2.0	ug/l	---	ND	2.0	ug/l	---	ND	2.0	ug/l	---	ND	2.0	ug/l	---	1.6	2.0	ug/l	J

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

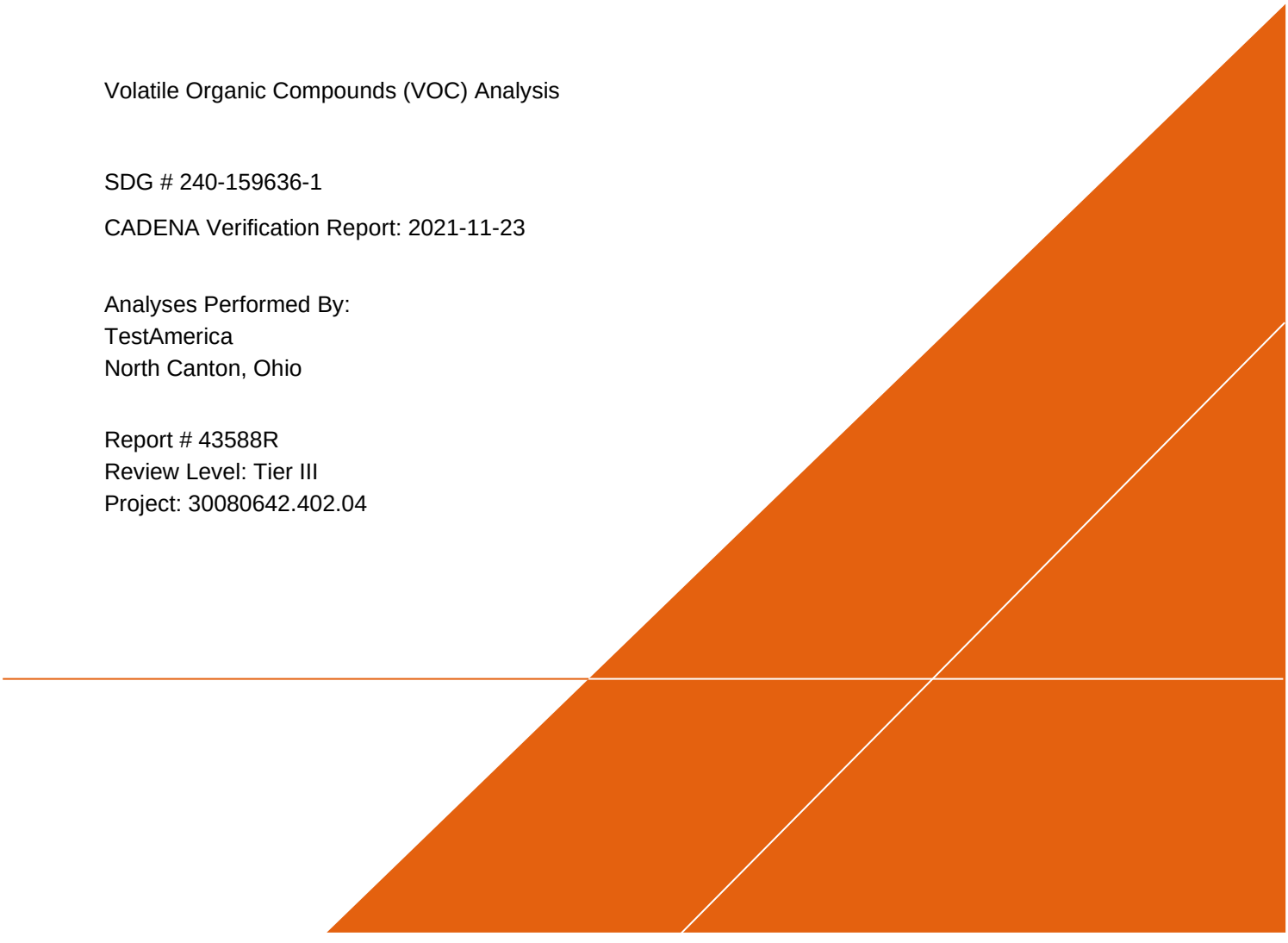
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159636-1

CADENA Verification Report: 2021-11-23

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43588R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159636-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_62	240-159636-1	Water	11/05/21		X	
MW-141S_110521	240-159636-2	Water	11/05/21		X	X
MW-139S_110521	240-159636-3	Water	11/05/21		X	X
MW-140S_110521	240-159636-4	Water	11/05/21		X	X
MW-79SR_110521	240-159636-5	Water	11/05/21		X	X
MW-79D_110521	240-159636-6	Water	11/05/21		X	X
DUP-13	240-159636-7	Water	11/05/21	MW-79D_110521	X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Compound	Criteria
MW-140S_110521 MW-79SR_110521 MW-79D_110521 DUP-13	Continuous Calibration Verification %D	Tetrachloroethene	+20.5%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J

Initial/Continuing	Criteria	Sample Result	Qualification
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compounds	Sample Result (µg/L)	Duplicate Result (µg/L)	RPD
MW-79D_110521 / DUP-13	1,4-Dioxane	2 U	1.6	AC
	Vinyl chloride	2.8	2.4	AC

Notes:

AC – Acceptable

The calculated differences between the parent sample and field duplicate were acceptable.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

DATA REVIEW

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE:

DATE: December 15, 2021

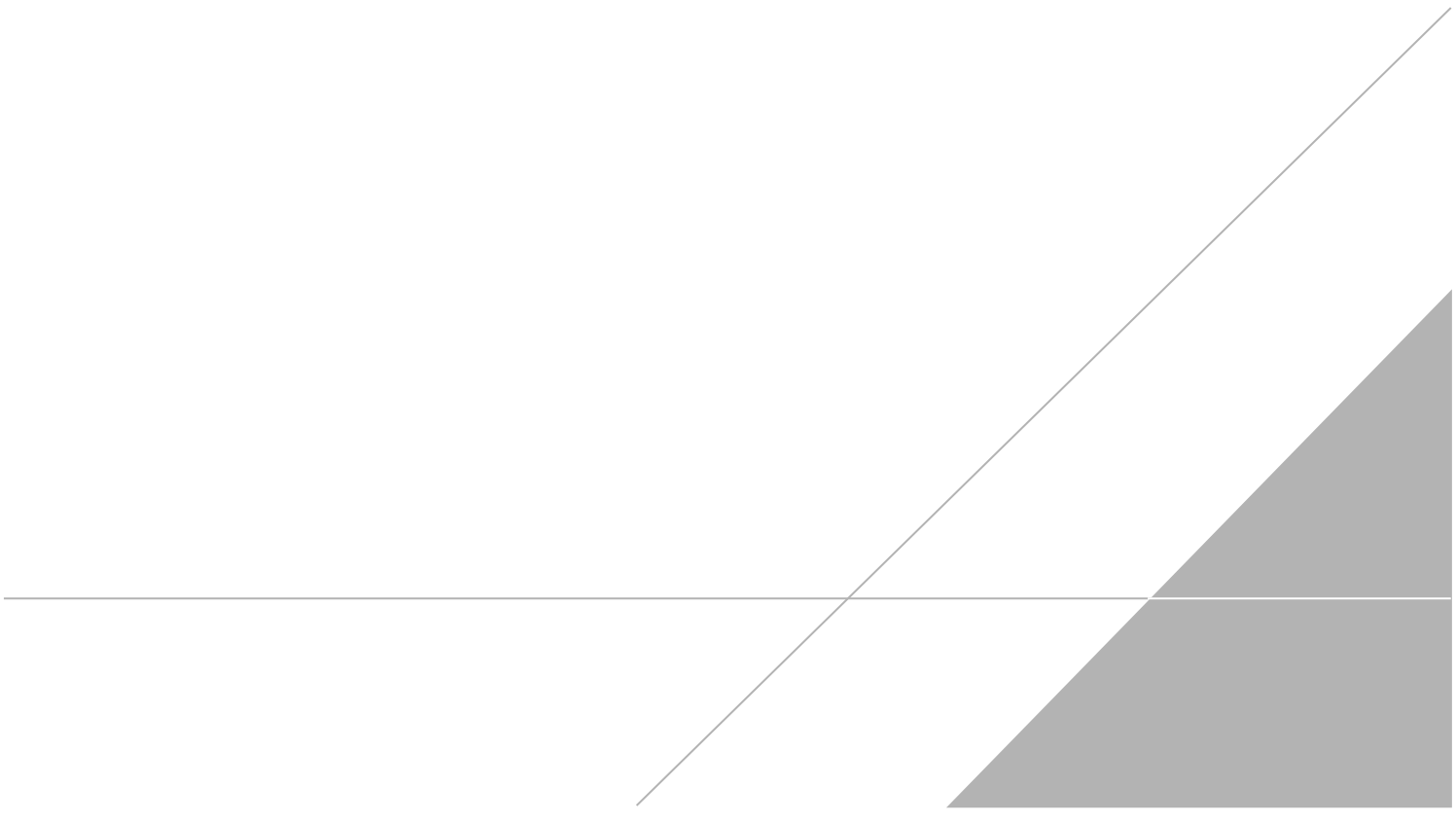
PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



Chain of Custody Record

MICHIGAN 190 — TestAmerica — THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Seth Turner	TAT if different from below: ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client:
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_62	---	---		X						1							X	X	X	X	X	X	X (ow)	1 Trip Blank
MW-14S_110521	11/5/21	850		X						6					N	G								3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-14S-MS_110521	11/5/21	850		X						6					N	G								RUN MS/MSD
MW-14S-MSD_110521	11/5/21	850		X						6					N	G								RUN MS/MSD
MW-13S_110521	11/5/21	1340		X						6					N	G	X	X	X	X	X	X	X	
MW-14OS_110521	11/5/21	1245		X						6					N	G	X	X	X	X	X	X	X	
MW-79SR_110521	11/5/21	1135		X						6					N	G	X	X	X	X	X	X	X	
MW-79D_110521	11/5/21	1035		X						6					N	G	X	X	X	X	X	X	X	
DUP-13	11/5/21	—		X						6					N	G	X	X	X	X	X	X	X	

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 mo): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalla@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

240-159636 Chain of Custody

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Seth Turner	Arcadis	11/5/21 / 1600	Novi Cold Storage	Arcadis	11/5/21/1600
[signature]	ARCADIS	11/8/21 / 1200	[signature]	ETA	11/8/21 / 1200
[signature]	ETA	11/8/21	[signature]	ETA	11-9-21 1000

Received in Laboratory by:

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11/23/2021

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159636-1

Client Sample ID: TRIP BLANK_62

Date Collected: 11/05/21 00:00
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159636-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 18:02	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 18:02	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 18:02	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 18:02	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 18:02	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 18:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*62 - 137*		*11/16/21 18:02*	*1*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*		*11/16/21 18:02*	*1*
Toluene-d8 (Surr)	*93*		*78 - 122*		*11/16/21 18:02*	*1*
Dibromofluoromethane (Surr)	*104*		*73 - 120*		*11/16/21 18:02*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159636-1

Client Sample ID: MW-141S_110521
Date Collected: 11/05/21 08:50
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159636-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U ~~F1~~	2.0	0.86	ug/L			11/17/21 18:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*		*11/17/21 18:31*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 21:59	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 21:59	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 21:59	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 21:59	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 21:59	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 21:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*		*11/16/21 21:59*	*1*
4-Bromofluorobenzene (Surr)	*89*		*56 - 136*		*11/16/21 21:59*	*1*
Toluene-d8 (Surr)	*99*		*78 - 122*		*11/16/21 21:59*	*1*
Dibromofluoromethane (Surr)	*113*		*73 - 120*		*11/16/21 21:59*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159636-1

Client Sample ID: MW-139S_110521
Date Collected: 11/05/21 13:40
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159636-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 02:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/17/21 02:10*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 21:35	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 21:35	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 21:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 21:35	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 21:35	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 21:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*		*11/16/21 21:35*	*1*
4-Bromofluorobenzene (Surr)	*89*		*56 - 136*		*11/16/21 21:35*	*1*
Toluene-d8 (Surr)	*101*		*78 - 122*		*11/16/21 21:35*	*1*
Dibromofluoromethane (Surr)	*113*		*73 - 120*		*11/16/21 21:35*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159636-1

Client Sample ID: MW-140S_110521
Date Collected: 11/05/21 12:45
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159636-4
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 02:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/17/21 02:34*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 19:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 19:22	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 19:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 19:22	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 19:22	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 19:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*62 - 137*		*11/17/21 19:22*	*1*
4-Bromofluorobenzene (Surr)	*88*		*56 - 136*		*11/17/21 19:22*	*1*
Toluene-d8 (Surr)	*98*		*78 - 122*		*11/17/21 19:22*	*1*
Dibromofluoromethane (Surr)	*105*		*73 - 120*		*11/17/21 19:22*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159636-1

Client Sample ID: MW-79SR_110521
Date Collected: 11/05/21 11:35
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159636-5
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 02:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*		*11/17/21 02:58*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 19:45	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 19:45	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 19:45	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 19:45	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 19:45	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 19:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/17/21 19:45*	*1*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*		*11/17/21 19:45*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*11/17/21 19:45*	*1*
Dibromofluoromethane (Surr)	*105*		*73 - 120*		*11/17/21 19:45*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159636-1

Client Sample ID: MW-79D_110521
Date Collected: 11/05/21 10:35
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159636-6
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 03:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/17/21 03:22*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 20:09	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 20:09	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 20:09	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 20:09	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 20:09	1
Vinyl chloride	**2.8**		1.0	0.45	ug/L			11/17/21 20:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*		*11/17/21 20:09*	*1*
4-Bromofluorobenzene (Surr)	*91*		*56 - 136*		*11/17/21 20:09*	*1*
Toluene-d8 (Surr)	*98*		*78 - 122*		*11/17/21 20:09*	*1*
Dibromofluoromethane (Surr)	*110*		*73 - 120*		*11/17/21 20:09*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159636-1

Client Sample ID: DUP-13
Date Collected: 11/05/21 00:00
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159636-7
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**1.6**	**J**	2.0	0.86	ug/L			11/17/21 03:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/17/21 03:46*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 20:33	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 20:33	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 20:33	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 20:33	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 20:33	1
Vinyl chloride	**2.4**		1.0	0.45	ug/L			11/17/21 20:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*		*11/17/21 20:33*	*1*
4-Bromofluorobenzene (Surr)	*89*		*56 - 136*		*11/17/21 20:33*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*11/17/21 20:33*	*1*
Dibromofluoromethane (Surr)	*110*		*73 - 120*		*11/17/21 20:33*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159737-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/24/2021 8:38:32 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159737-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159737-1

Job ID: 240-159737-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159737-1

Comments
No additional comments.

Receipt
The samples were received on 11/10/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 0.7º C and 0.8º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159737-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159737-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159737-1	TRIP BLANK_81	Water	11/08/21 00:00	11/10/21 08:00
240-159737-2	MW-80SR_110821	Water	11/08/21 08:21	11/10/21 08:00
240-159737-3	DUP-07	Water	11/08/21 00:00	11/10/21 08:00
240-159737-4	MW-137S_110821	Water	11/08/21 14:13	11/10/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159737-1

Client Sample ID: TRIP BLANK_81 — Lab Sample ID: 240-159737-1

No Detections.

Client Sample ID: MW-80SR_110821 — Lab Sample ID: 240-159737-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	3.6		1.0	0.45	ug/L	1		8260B	Total/NA

Client Sample ID: DUP-07 — Lab Sample ID: 240-159737-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	3.4		1.0	0.45	ug/L	1		8260B	Total/NA

Client Sample ID: MW-137S_110821 — Lab Sample ID: 240-159737-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	0.65	J	1.0	0.45	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159737-1

Client Sample ID: TRIP BLANK_81

Date Collected: 11/08/21 00:00
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159737-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 18:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 18:46	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 18:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 18:46	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 18:46	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 18:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*111*		*62 - 137*		*11/17/21 18:46*	*1*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*		*11/17/21 18:46*	*1*
Toluene-d8 (Surr)	*97*		*78 - 122*		*11/17/21 18:46*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/17/21 18:46*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159737-1

Client Sample ID: MW-80SR_110821
Date Collected: 11/08/21 08:21
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159737-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 00:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*66 - 120*		*11/18/21 00:21*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 20:02	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 20:02	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 20:02	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 20:02	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 20:02	1
Vinyl chloride	**3.6**		1.0	0.45	ug/L			11/17/21 20:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*62 - 137*		*11/17/21 20:02*	*1*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*		*11/17/21 20:02*	*1*
Toluene-d8 (Surr)	*99*		*78 - 122*		*11/17/21 20:02*	*1*
Dibromofluoromethane (Surr)	*103*		*73 - 120*		*11/17/21 20:02*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159737-1

Client Sample ID: DUP-07
Date Collected: 11/08/21 00:00
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159737-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 00:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*66 - 120*		*11/18/21 00:45*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 20:27	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 20:27	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 20:27	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 20:27	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 20:27	1
Vinyl chloride	**3.4**		1.0	0.45	ug/L			11/17/21 20:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*62 - 137*		*11/17/21 20:27*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/17/21 20:27*	*1*
Toluene-d8 (Surr)	*98*		*78 - 122*		*11/17/21 20:27*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/17/21 20:27*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159737-1

Client Sample ID: MW-137S_110821
Date Collected: 11/08/21 14:13
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159737-4
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 01:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*66 - 120*		*11/18/21 01:09*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 20:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 20:52	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 20:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 20:52	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 20:52	1
Vinyl chloride	**0.65**	**J**	1.0	0.45	ug/L			11/17/21 20:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*113*		*62 - 137*		*11/17/21 20:52*	*1*
4-Bromofluorobenzene (Surr)	*80*		*56 - 136*		*11/17/21 20:52*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*11/17/21 20:52*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/17/21 20:52*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159737-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159737-1	TRIP BLANK_81	111	84	97	101
240-159737-2	MW-80SR_110821	112	85	99	103
240-159737-3	DUP-07	110	82	98	102
240-159737-4	MW-137S_110821	113	80	95	101
240-159739-E-3 MS	Matrix Spike	103	96	98	96
240-159739-H-3 MSD	Matrix Spike Duplicate	102	101	102	100
LCS 240-513438/9	Lab Control Sample	105	99	96	102
MB 240-513438/7	Method Blank	112	82	95	102

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159642-H-3 MS	Matrix Spike	87
240-159642-M-3 MSD	Matrix Spike Duplicate	87
240-159737-2	MW-80SR_110821	88
240-159737-3	DUP-07	86
240-159737-4	MW-137S_110821	86
LCS 240-513480/3	Lab Control Sample	84
MB 240-513480/4	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513438/7
Matrix: Water
Analysis Batch: 513438

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 13:28	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 13:28	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 13:28	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 13:28	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 13:28	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 13:28	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*62 - 137*		*11/17/21 13:28*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/17/21 13:28*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*11/17/21 13:28*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/17/21 13:28*	*1*

Lab Sample ID: LCS 240-513438/9
Matrix: Water
Analysis Batch: 513438

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	26.4		ug/L		106	63 - 134
cis-1,2-Dichloroethene	25.0	24.2		ug/L		97	77 - 123
Tetrachloroethene	25.0	30.7		ug/L		123	76 - 123
trans-1,2-Dichloroethene	25.0	25.7		ug/L		103	75 - 124
Trichloroethene	25.0	25.0		ug/L		100	70 - 122
Vinyl chloride	25.0	24.9		ug/L		100	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*
4-Bromofluorobenzene (Surr)	*99*		*56 - 136*
Toluene-d8 (Surr)	*96*		*78 - 122*
Dibromofluoromethane (Surr)	*102*		*73 - 120*

Lab Sample ID: 240-159739-E-3 MS
Matrix: Water
Analysis Batch: 513438

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	25.0	22.7		ug/L		91	56 - 135
cis-1,2-Dichloroethene	1.0	U	25.0	21.7		ug/L		87	66 - 128
Tetrachloroethene	1.0	U	25.0	29.7		ug/L		119	62 - 131
trans-1,2-Dichloroethene	1.0	U	25.0	23.3		ug/L		93	56 - 136
Trichloroethene	1.0	U	25.0	24.1		ug/L		96	61 - 124
Vinyl chloride	1.0	U	25.0	21.0		ug/L		84	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*
4-Bromofluorobenzene (Surr)	*96*		*56 - 136*
Toluene-d8 (Surr)	*98*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159739-E-3 MS
Matrix: Water
Analysis Batch: 513438

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*96*		*73 - 120*

Lab Sample ID: 240-159739-H-3 MSD
Matrix: Water
Analysis Batch: 513438

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	25.0	24.5		ug/L		98	56 - 135	7	26
cis-1,2-Dichloroethene	1.0	U	25.0	22.4		ug/L		90	66 - 128	3	14
Tetrachloroethene	1.0	U	25.0	29.4		ug/L		118	62 - 131	1	20
trans-1,2-Dichloroethene	1.0	U	25.0	24.2		ug/L		97	56 - 136	4	15
Trichloroethene	1.0	U	25.0	23.4		ug/L		94	61 - 124	3	15
Vinyl chloride	1.0	U	25.0	23.5		ug/L		94	43 - 157	11	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*
4-Bromofluorobenzene (Surr)	*101*		*56 - 136*
Toluene-d8 (Surr)	*102*		*78 - 122*
Dibromofluoromethane (Surr)	*100*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513480/4
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 19:58	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/17/21 19:58*	*1*

Lab Sample ID: LCS 240-513480/3
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.37		ug/L		94	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*

Lab Sample ID: 240-159642-H-3 MS
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.3		ug/L		103	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

Lab Sample ID: 240-159642-M-3 MSD
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.57		ug/L		96	51 - 153	7	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159737-1

GC/MS VOA

Analysis Batch: 513438

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159737-1	TRIP BLANK_81	Total/NA	Water	8260B	
240-159737-2	MW-80SR_110821	Total/NA	Water	8260B	
240-159737-3	DUP-07	Total/NA	Water	8260B	
240-159737-4	MW-137S_110821	Total/NA	Water	8260B	
MB 240-513438/7	Method Blank	Total/NA	Water	8260B	
LCS 240-513438/9	Lab Control Sample	Total/NA	Water	8260B	
240-159739-E-3 MS	Matrix Spike	Total/NA	Water	8260B	
240-159739-H-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 513480

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159737-2	MW-80SR_110821	Total/NA	Water	8260B SIM	
240-159737-3	DUP-07	Total/NA	Water	8260B SIM	
240-159737-4	MW-137S_110821	Total/NA	Water	8260B SIM	
MB 240-513480/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513480/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159642-H-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159642-M-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159737-1

Client Sample ID: TRIP BLANK_81
Date Collected: 11/08/21 00:00
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159737-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513438	11/17/21 18:46	SAM	TAL CAN

Client Sample ID: MW-80SR_110821
Date Collected: 11/08/21 08:21
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159737-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513438	11/17/21 20:02	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	513480	11/18/21 00:21	CS	TAL CAN

Client Sample ID: DUP-07
Date Collected: 11/08/21 00:00
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159737-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513438	11/17/21 20:27	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	513480	11/18/21 00:45	CS	TAL CAN

Client Sample ID: MW-137S_110821
Date Collected: 11/08/21 14:13
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159737-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513438	11/17/21 20:52	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	513480	11/18/21 01:09	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159737-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Sommer Guy	TAT if different from below		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:	10 day ✓ 2 weeks / 3 weeks / 1 week / 2 days / 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 81	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-80SR_110821	11/8/21	8:21		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
DUP-07	11/8/21	[redacted]		X						6					N	G	X	X	X	X	X	X	X	↓
MW-137S-110821	11/8/21	14:13		X						6					N	G	X	X	X	X	X	X	X	↓

240-159737 Chain of Custody

Possible Hazard Identification
✓ Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Return to Client ✓ Disposal By Lab Archive For Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Sommer Guy	Arcadis	11/8/21 15:30	Novi Cold Storage	Arcadis	11/8/21 15:30
[redacted]	ARCADIS	11/9/21 1040	[redacted]	ETA	11/9/21 1040
[redacted]	ETA	11/9/21 1055	Mandalyn Block	ETA	11-10-21 8:00

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11/24/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 159937
Canton Facility

Client Arcadis Site Name

Cooler Received on 11-10-21 Opened on 11-10-21

Cooler unpacked by: Marilyn Bleau

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: ~~Bubble Wrap~~ Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity_____	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC157842
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #_____	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

No SIM on TB per corrected COC. ome 11/10/21

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) TripBlank-81 were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

Login # : 159737

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form			
Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
TA Client Box Other	IR-14 IR-15	0-6	0-7	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15	0-7	0-8	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15	

DATA VERIFICATION REPORT

November 24, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159737-1
Sample date: 2021-11-08
Report received by CADENA: 2021-11-24
Initial Data Verification completed by CADENA: 2021-11-24
Number of Samples:4
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159737-1

		Sample Name:	TRIP BLANK_81				MW-80SR_110821				DUP-07				MW-137S_110821			
		Lab Sample ID:	2401597371				2401597372				2401597373				2401597374			
		Sample Date:	11/8/2021				11/8/2021				11/8/2021				11/8/2021			
	Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC																		
	OSW-8260B																	
	1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Vinyl chloride	75-01-4	ND	1.0	ug/l	---	3.6	1.0	ug/l	---	3.4	1.0	ug/l	---	0.65	1.0	ug/l	J
	OSW-8260BBSim																	
	1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

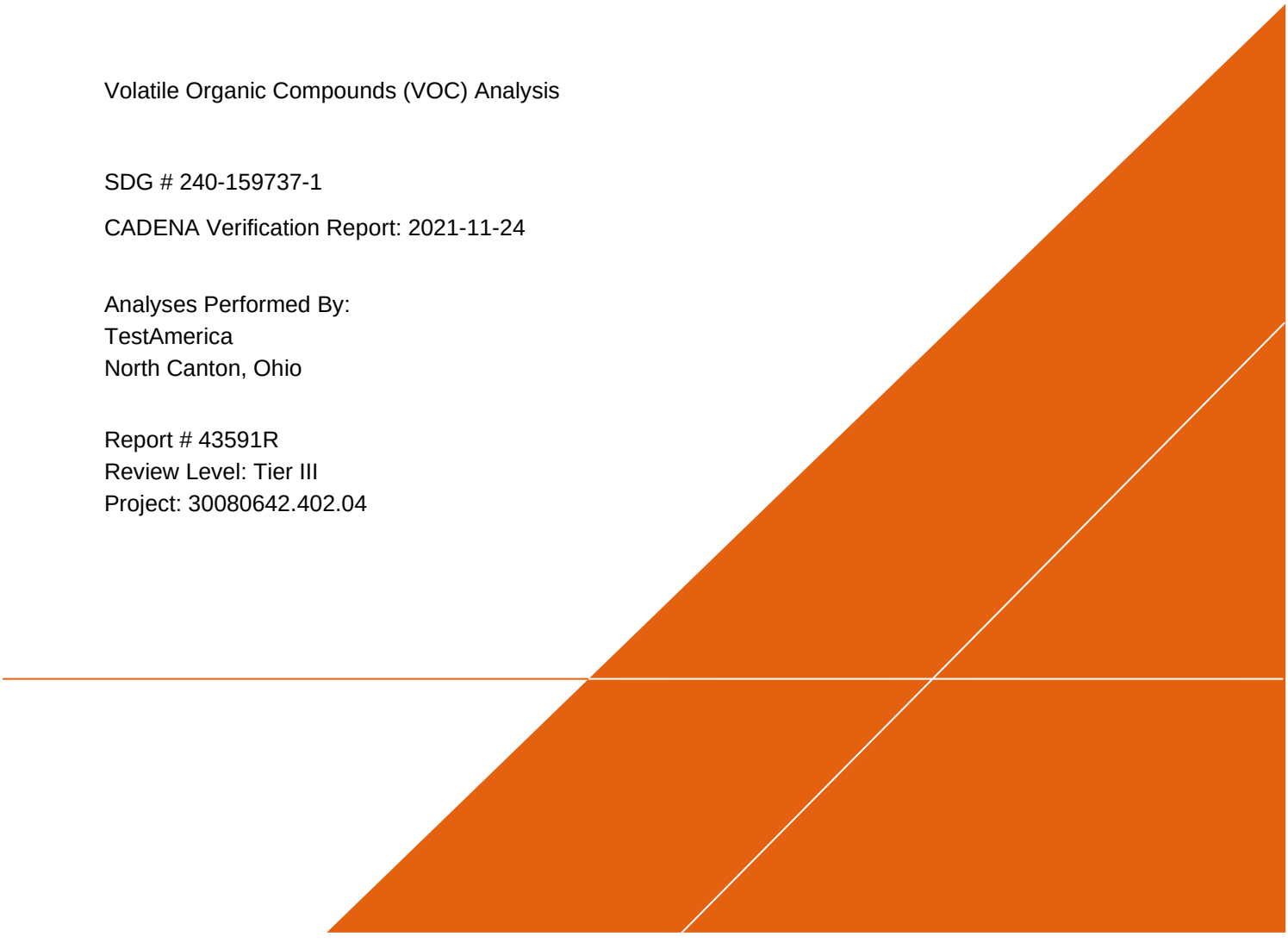
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159737-1

CADENA Verification Report: 2021-11-24

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43591R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159737-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_81	240-159737-1	Water	11/08/21		X	
MW-80SR_110821	240-159737-2	Water	11/08/21		X	X
DUP-07	240-159737-3	Water	11/08/21	MW-80SR_110821	X	X
MW-137S_110821	240-159737-4	Water	11/08/21		X	X

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result (µg/L)	Duplicate Result (µg/L)	RPD
MW-80SR_110821 / DUP-07	Vinyl chloride	3.6	3.4	AC

Notes:

AC – Acceptable

The calculated differences between the parent sample and field duplicate were acceptable.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE:

DATE: December 15, 2021

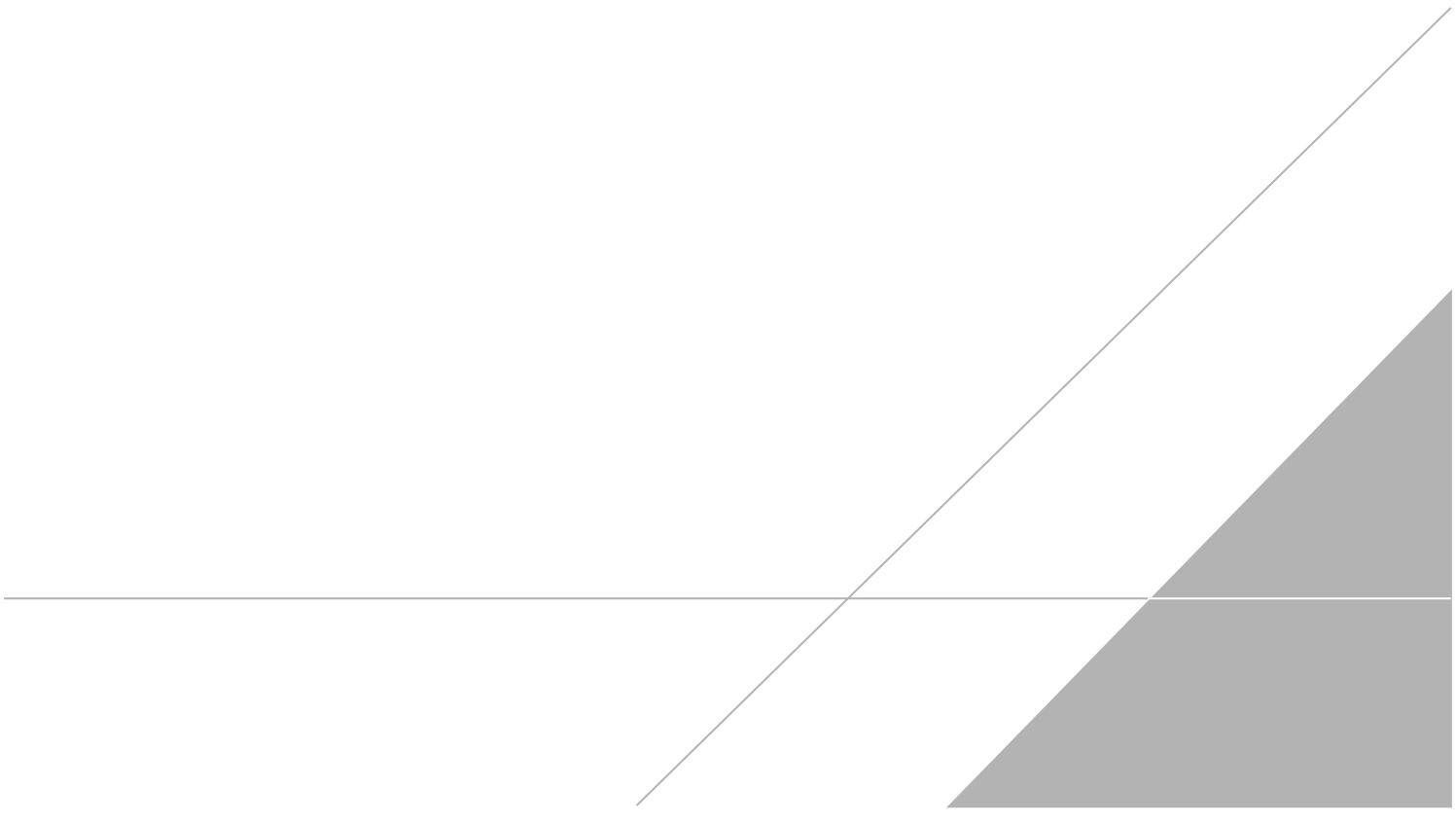
PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



MICHIGAN 190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Sommer Guy	TAT if different from below		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:	10 day ✓ 2 weeks / 3 weeks / 1 week / 2 days / 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 81	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-80SR_110821	11/8/21	8:21		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
DUP-07	11/8/21	[redacted]		X						6					N	G	X	X	X	X	X	X	X	↓
MW-137S-110821	11/8/21	14:13		X						6					N	G	X	X	X	X	X	X	X	↓

240-159737 Chain of Custody

Possible Hazard Identification
✓ Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Return to Client ✓ Disposal By Lab Archive For Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Sommer Guy	Arcadis	11/8/21 15:30	Novi Cold Storage	Arcadis	11/8/21 15:30
[redacted]	ARCADIS	11/9/21 1040	[redacted]	ETA	11/9/21 1040
[redacted]	ETA	11/9/21 1055	Mandahy Block	ETA	11-10-21 8:00

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11/24/2021

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159737-1

Client Sample ID: TRIP BLANK_81

Date Collected: 11/08/21 00:00
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159737-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 18:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 18:46	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 18:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 18:46	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 18:46	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 18:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*111*		*62 - 137*		*11/17/21 18:46*	*1*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*		*11/17/21 18:46*	*1*
Toluene-d8 (Surr)	*97*		*78 - 122*		*11/17/21 18:46*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/17/21 18:46*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159737-1

Client Sample ID: MW-80SR_110821
Date Collected: 11/08/21 08:21
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159737-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 00:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*66 - 120*		*11/18/21 00:21*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 20:02	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 20:02	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 20:02	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 20:02	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 20:02	1
Vinyl chloride	**3.6**		1.0	0.45	ug/L			11/17/21 20:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*62 - 137*		*11/17/21 20:02*	*1*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*		*11/17/21 20:02*	*1*
Toluene-d8 (Surr)	*99*		*78 - 122*		*11/17/21 20:02*	*1*
Dibromofluoromethane (Surr)	*103*		*73 - 120*		*11/17/21 20:02*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159737-1

Client Sample ID: DUP-07
Date Collected: 11/08/21 00:00
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159737-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 00:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*66 - 120*		*11/18/21 00:45*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 20:27	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 20:27	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 20:27	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 20:27	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 20:27	1
Vinyl chloride	**3.4**		1.0	0.45	ug/L			11/17/21 20:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*62 - 137*		*11/17/21 20:27*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/17/21 20:27*	*1*
Toluene-d8 (Surr)	*98*		*78 - 122*		*11/17/21 20:27*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/17/21 20:27*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159737-1

Client Sample ID: MW-137S_110821
Date Collected: 11/08/21 14:13
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159737-4
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 01:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*66 - 120*		*11/18/21 01:09*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 20:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 20:52	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 20:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 20:52	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 20:52	1
Vinyl chloride	**0.65**	**J**	1.0	0.45	ug/L			11/17/21 20:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*113*		*62 - 137*		*11/17/21 20:52*	*1*
4-Bromofluorobenzene (Surr)	*80*		*56 - 136*		*11/17/21 20:52*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*11/17/21 20:52*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/17/21 20:52*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159739-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/24/2021 1:54:51 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159739-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159739-1

Job ID: 240-159739-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159739-1

Comments
No additional comments.

Receipt
The samples were received on 11/10/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 0.7º C and 0.8º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159739-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159739-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159739-1	TRIP BLANK_93	Water	11/08/21 00:00	11/10/21 08:00
240-159739-2	MW-84_110821	Water	11/08/21 16:10	11/10/21 08:00
240-159739-3	MW-81_110821	Water	11/08/21 11:10	11/10/21 08:00
240-159739-4	MW-81S_110821	Water	11/08/21 12:50	11/10/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159739-1

Client Sample ID: TRIP BLANK_93 — Lab Sample ID: 240-159739-1

No Detections.

Client Sample ID: MW-84_110821 — Lab Sample ID: 240-159739-2

No Detections.

Client Sample ID: MW-81_110821 — Lab Sample ID: 240-159739-3

No Detections.

Client Sample ID: MW-81S_110821 — Lab Sample ID: 240-159739-4

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159739-1

Client Sample ID: TRIP BLANK_93

Date Collected: 11/08/21 00:00
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159739-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 19:11	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 19:11	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 19:11	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 19:11	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 19:11	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 19:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*114*		*62 - 137*		*11/17/21 19:11*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/17/21 19:11*	*1*
Toluene-d8 (Surr)	*97*		*78 - 122*		*11/17/21 19:11*	*1*
Dibromofluoromethane (Surr)	*103*		*73 - 120*		*11/17/21 19:11*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159739-1

Client Sample ID: MW-84_110821
Date Collected: 11/08/21 16:10
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159739-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 01:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*66 - 120*		*11/18/21 01:33*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 21:17	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 21:17	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 21:17	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 21:17	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 21:17	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 21:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*62 - 137*		*11/17/21 21:17*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/17/21 21:17*	*1*
Toluene-d8 (Surr)	*98*		*78 - 122*		*11/17/21 21:17*	*1*
Dibromofluoromethane (Surr)	*108*		*73 - 120*		*11/17/21 21:17*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159739-1

Client Sample ID: MW-81_110821
Date Collected: 11/08/21 11:10
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159739-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U F1	2.0	0.86	ug/L			11/18/21 20:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*		*11/18/21 20:31*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 19:36	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 19:36	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 19:36	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 19:36	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 19:36	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 19:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*62 - 137*		*11/17/21 19:36*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/17/21 19:36*	*1*
Toluene-d8 (Surr)	*97*		*78 - 122*		*11/17/21 19:36*	*1*
Dibromofluoromethane (Surr)	*103*		*73 - 120*		*11/17/21 19:36*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159739-1

Client Sample ID: MW-81S_110821
Date Collected: 11/08/21 12:50
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159739-4
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 01:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*66 - 120*		*11/18/21 01:57*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 21:42	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 21:42	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 21:42	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 21:42	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 21:42	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 21:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*111*		*62 - 137*		*11/17/21 21:42*	*1*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*		*11/17/21 21:42*	*1*
Toluene-d8 (Surr)	*100*		*78 - 122*		*11/17/21 21:42*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/17/21 21:42*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159739-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159739-1	TRIP BLANK_93	114	81	97	103
240-159739-2	MW-84_110821	116	82	98	108
240-159739-3	MW-81_110821	112	82	97	103
240-159739-3 MS	MW-81-MS_110821	103	96	98	96
240-159739-3 MSD	MW-81-MSD_110821	102	101	102	100
240-159739-4	MW-81S_110821	111	84	100	102
LCS 240-513438/9	Lab Control Sample	105	99	96	102
MB 240-513438/7	Method Blank	112	82	95	102

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159642-H-3 MS	Matrix Spike	87
240-159642-M-3 MSD	Matrix Spike Duplicate	87
240-159739-2	MW-84_110821	88
240-159739-3	MW-81_110821	75
240-159739-3 MS	MW-81-MS_110821	74
240-159739-3 MSD	MW-81-MSD_110821	75
240-159739-4	MW-81S_110821	88
LCS 240-513480/3	Lab Control Sample	84
LCS 240-513700/4	Lab Control Sample	75
MB 240-513480/4	Method Blank	84
MB 240-513700/5	Method Blank	77

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513438/7
Matrix: Water
Analysis Batch: 513438

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 13:28	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 13:28	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 13:28	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 13:28	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 13:28	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 13:28	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*62 - 137*		*11/17/21 13:28*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/17/21 13:28*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*11/17/21 13:28*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/17/21 13:28*	*1*

Lab Sample ID: LCS 240-513438/9
Matrix: Water
Analysis Batch: 513438

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	26.4		ug/L		106	63 - 134
cis-1,2-Dichloroethene	25.0	24.2		ug/L		97	77 - 123
Tetrachloroethene	25.0	30.7		ug/L		123	76 - 123
trans-1,2-Dichloroethene	25.0	25.7		ug/L		103	75 - 124
Trichloroethene	25.0	25.0		ug/L		100	70 - 122
Vinyl chloride	25.0	24.9		ug/L		100	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*
4-Bromofluorobenzene (Surr)	*99*		*56 - 136*
Toluene-d8 (Surr)	*96*		*78 - 122*
Dibromofluoromethane (Surr)	*102*		*73 - 120*

Lab Sample ID: 240-159739-3 MS
Matrix: Water
Analysis Batch: 513438

Client Sample ID: MW-81-MS_110821
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	25.0	22.7		ug/L		91	56 - 135
cis-1,2-Dichloroethene	1.0	U	25.0	21.7		ug/L		87	66 - 128
Tetrachloroethene	1.0	U	25.0	29.7		ug/L		119	62 - 131
trans-1,2-Dichloroethene	1.0	U	25.0	23.3		ug/L		93	56 - 136
Trichloroethene	1.0	U	25.0	24.1		ug/L		96	61 - 124
Vinyl chloride	1.0	U	25.0	21.0		ug/L		84	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*
4-Bromofluorobenzene (Surr)	*96*		*56 - 136*
Toluene-d8 (Surr)	*98*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159739-3 MS
Matrix: Water
Analysis Batch: 513438

Client Sample ID: MW-81-MS_110821
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*96*		*73 - 120*

Lab Sample ID: 240-159739-3 MSD
Matrix: Water
Analysis Batch: 513438

Client Sample ID: MW-81-MSD_110821
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	25.0	24.5		ug/L		98	56 - 135	7	26
cis-1,2-Dichloroethene	1.0	U	25.0	22.4		ug/L		90	66 - 128	3	14
Tetrachloroethene	1.0	U	25.0	29.4		ug/L		118	62 - 131	1	20
trans-1,2-Dichloroethene	1.0	U	25.0	24.2		ug/L		97	56 - 136	4	15
Trichloroethene	1.0	U	25.0	23.4		ug/L		94	61 - 124	3	15
Vinyl chloride	1.0	U	25.0	23.5		ug/L		94	43 - 157	11	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*
4-Bromofluorobenzene (Surr)	*101*		*56 - 136*
Toluene-d8 (Surr)	*102*		*78 - 122*
Dibromofluoromethane (Surr)	*100*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513480/4
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 19:58	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/17/21 19:58*	*1*

Lab Sample ID: LCS 240-513480/3
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.37		ug/L		94	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*

Lab Sample ID: 240-159642-H-3 MS
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.3		ug/L		103	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	87		66 - 120

Lab Sample ID: 240-159642-M-3 MSD — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 513480

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.57		ug/L		96	51 - 153	7	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	87		66 - 120

Lab Sample ID: MB 240-513700/5 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 513700

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 19:41	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	77		66 - 120		11/18/21 19:41	1

Lab Sample ID: LCS 240-513700/4 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 513700

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.4		ug/L		104	80 - 122		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	75		66 - 120

Lab Sample ID: 240-159739-3 MS — **Client Sample ID: MW-81-MS_110821**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 513700

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U F1	10.0	10.4		ug/L		104	51 - 153		

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	74		66 - 120

Lab Sample ID: 240-159739-3 MSD — **Client Sample ID: MW-81-MSD_110821**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 513700

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153	2	16

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159739-3 MSD
Matrix: Water
Analysis Batch: 513700

Client Sample ID: MW-81-MSD_110821
Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159739-1

GC/MS VOA

Analysis Batch: 513438

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159739-1	TRIP BLANK_93	Total/NA	Water	8260B	
240-159739-2	MW-84_110821	Total/NA	Water	8260B	
240-159739-3	MW-81_110821	Total/NA	Water	8260B	
240-159739-4	MW-81S_110821	Total/NA	Water	8260B	
MB 240-513438/7	Method Blank	Total/NA	Water	8260B	
LCS 240-513438/9	Lab Control Sample	Total/NA	Water	8260B	
240-159739-3 MS	MW-81-MS_110821	Total/NA	Water	8260B	
240-159739-3 MSD	MW-81-MSD_110821	Total/NA	Water	8260B	

Analysis Batch: 513480

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159739-2	MW-84_110821	Total/NA	Water	8260B SIM	
240-159739-4	MW-81S_110821	Total/NA	Water	8260B SIM	
MB 240-513480/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513480/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159642-H-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159642-M-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513700

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159739-3	MW-81_110821	Total/NA	Water	8260B SIM	
MB 240-513700/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513700/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159739-3 MS	MW-81-MS_110821	Total/NA	Water	8260B SIM	
240-159739-3 MSD	MW-81-MSD_110821	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159739-1

Client Sample ID: TRIP BLANK_93
Date Collected: 11/08/21 00:00
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159739-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513438	11/17/21 19:11	SAM	TAL CAN

Client Sample ID: MW-84_110821
Date Collected: 11/08/21 16:10
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159739-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513438	11/17/21 21:17	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	513480	11/18/21 01:33	CS	TAL CAN

Client Sample ID: MW-81_110821
Date Collected: 11/08/21 11:10
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159739-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513438	11/17/21 19:36	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	513700	11/18/21 20:31	CS	TAL CAN

Client Sample ID: MW-81S_110821
Date Collected: 11/08/21 12:50
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159739-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513438	11/17/21 21:42	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	513480	11/18/21 01:57	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159739-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Sam Hindl / COURIER: CHRISTINA WEBBER	TAT if different from below: 10 day; 3 weeks; ✓ 2 weeks; 1 week; 2 days; 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_93	—	—		X						1					N	G	X	X	X	X	X	X	* (EW)	1 Trip Blank
MW-84_110821	11/8/21	16:10		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-81_110821	11/8/21	11:10		6						6					N	G	X	X	X	X	X	X	X	
MW-81-MS_110821	11/8/21	11:10		6						6					N	G	X	X	X	X	X	X	X	Run MS/MSD
MW-81-MSD_110821	11/8/21	11:10		6						6					N	G	X	X	X	X	X	X	X	Run MS/MSD
MW-815_110821	11/8/21	12:50		6						6					N	G	X	X	X	X	X	X	X	

240-159739 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retai: Return to Client; ✓ Disposal By Lab; A

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
SH / [illegible]	Arcadis	11/8/21 17:30	NOVI COLD STORAGE	ARCADIS	11/8/21 17:30
[illegible]	ARCADIS	11/9/21 1040	Jen Hale	ETA	11/9/21 1040
Jen Hale	ETA	11/9/21 1055	Mandolyn Block	ETA	11/10/21 8:00

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11/24/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159436**
Canton Facility

Client Arcadis Site Name

Cooler Received on 11-10-21 Opened on 11-10-21

Cooler unpacked by: Marilyn Bleau

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity_____	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC157842
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #_____	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

No SIM on TB per Corrected COC. 11/10/21

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

Login # : 159739

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form				
Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
TA Client Box Other	IR-14 IR-15	0-6	0-7	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15	0-7	0-8	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
☐ See Temperature Excursion Form				

WI-NC-099 Cooler Receipt Form Page 2 – Multiple Coolers

DATA VERIFICATION REPORT

November 25, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159739-1
Sample date: 2021-11-08
Report received by CADENA: 2021-11-24
Initial Data Verification completed by CADENA: 2021-11-25
Number of Samples:4
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, MS/MSD Recovery, MS/MSD RPD, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159739-1

	Sample Name:	TRIP BLANK_93				MW-84_110821				MW-81_110821				MW-81S_110821			
	Lab Sample ID:	2401597391				2401597392				2401597393				2401597394			
	Sample Date:	11/8/2021				11/8/2021				11/8/2021				11/8/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC																	
OSW-8260B																	
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim																	
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---	ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

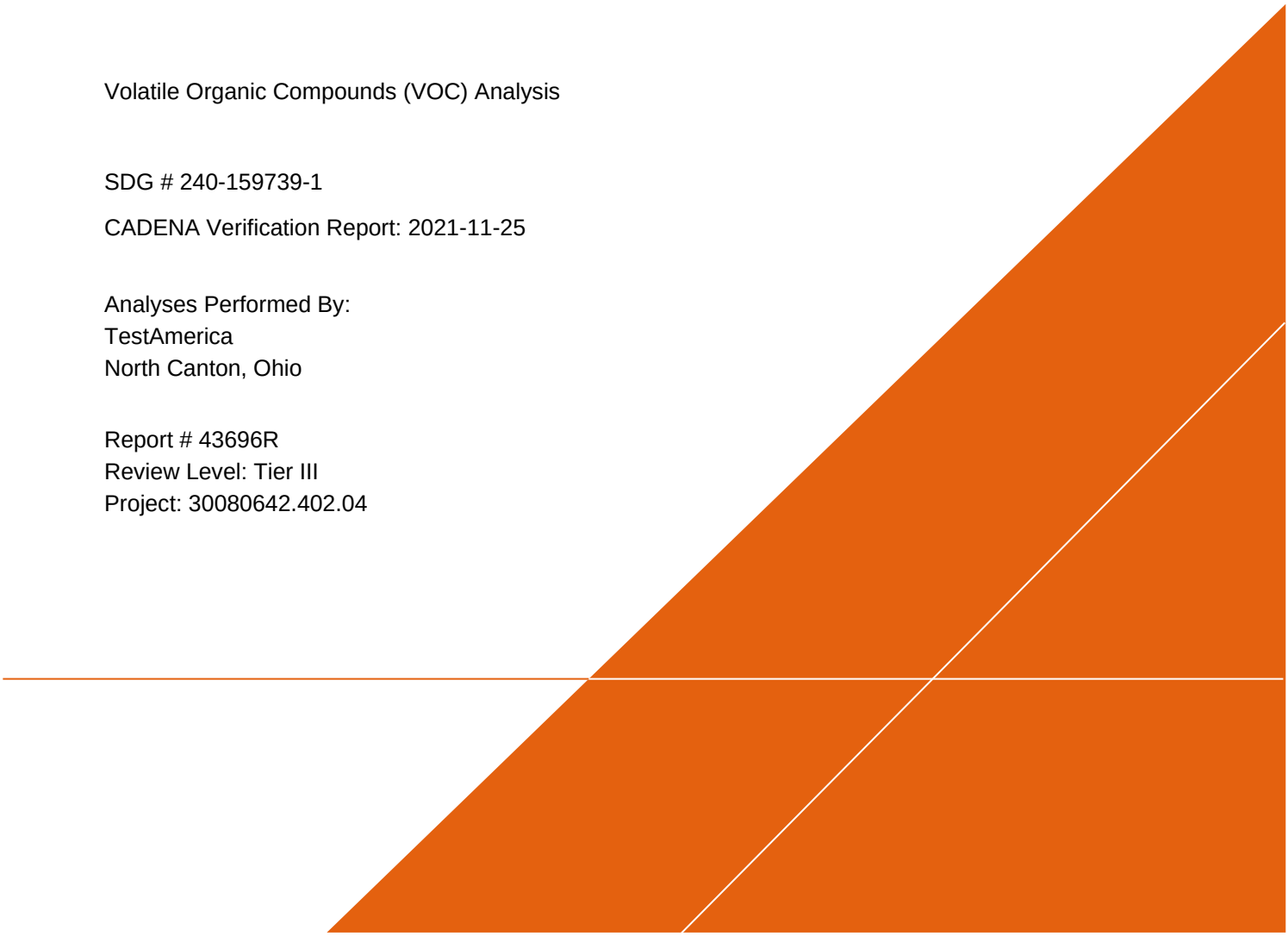
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159739-1

CADENA Verification Report: 2021-11-25

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43696R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159739-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_93	240-159739-1	Water	11/08/21		X	
MW-84_110821	240-159739-2	Water	11/08/21		X	X
MW-81_110821	240-159739-3	Water	11/08/21		X	X
MW-81S_110821	240-159739-4	Water	11/08/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 13, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Sam Hindl / COURIER: CHRISTINA WEAVER	TAT if different from below: 10 day ✓ 2 weeks; 3 weeks; 1 week; 2 days; 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM				Sample Specific Notes / Special Instructions:
TRIP BLANK_93	—	—		X						1					N	G	X	X	X	X	X	X	* (EW)				1 Trip Blank
MW-84_110821	11/8/21	16:10		6						6					N	G	X	X	X	X	X	X	X				3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-81_110821	11/8/21	11:10		6						6					N	G	X	X	X	X	X	X	X				
MW-81-MS_110821	11/8/21	11:10		6						6					N	G	X	X	X	X	X	X	X				Run MS/MSD
MW-81-MSD_110821	11/8/21	11:10		6						6					N	G	X	X	X	X	X	X	X				Run MS/MSD
MW-815_110821	11/8/21	12:50		6						6					N	G	X	X	X	X	X	X	X				

240-159739 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retai: ☐ Return to Client ✓ Disposal By Lab ☐ A

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
SH / Christina Weaver	Arcadis	11/8/21 17:30	Novi Cold Storage	Arcadis	11/8/21 17:30
Christina Weaver	Arcadis	11/9/21 1040	Jen Hale	ETA	11/9/21 1040
Jen Hale	ETA	11/9/21 1055	Mandy Block	ETA	11/10/21 8:00

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Client Sample ID: TRIP BLANK_93
Lab Sample ID: 240-159739-1
Date Collected: 11/08/21 00:00
Matrix: Water
Date Received: 11/10/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 19:11	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 19:11	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 19:11	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 19:11	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 19:11	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 19:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*114*		*62 - 137*		*11/17/21 19:11*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/17/21 19:11*	*1*
Toluene-d8 (Surr)	*97*		*78 - 122*		*11/17/21 19:11*	*1*
Dibromofluoromethane (Surr)	*103*		*73 - 120*		*11/17/21 19:11*	*1*

Client Sample ID: MW-84_110821
Lab Sample ID: 240-159739-2
Date Collected: 11/08/21 16:10
Matrix: Water
Date Received: 11/10/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 01:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*66 - 120*		*11/18/21 01:33*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 21:17	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 21:17	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 21:17	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 21:17	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 21:17	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 21:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*62 - 137*		*11/17/21 21:17*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/17/21 21:17*	*1*
Toluene-d8 (Surr)	*98*		*78 - 122*		*11/17/21 21:17*	*1*
Dibromofluoromethane (Surr)	*108*		*73 - 120*		*11/17/21 21:17*	*1*

Client Sample ID: MW-81_110821
Lab Sample ID: 240-159739-3
Date Collected: 11/08/21 11:10
Matrix: Water
Date Received: 11/10/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U F1	2.0	0.86	ug/L			11/18/21 20:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*		*11/18/21 20:31*	*1*

Client Sample ID: MW-81_110821
Lab Sample ID: 240-159739-3
Date Collected: 11/08/21 11:10
Matrix: Water
Date Received: 11/10/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 19:36	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 19:36	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 19:36	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 19:36	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 19:36	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 19:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*62 - 137*		*11/17/21 19:36*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/17/21 19:36*	*1*
Toluene-d8 (Surr)	*97*		*78 - 122*		*11/17/21 19:36*	*1*
Dibromofluoromethane (Surr)	*103*		*73 - 120*		*11/17/21 19:36*	*1*

Client Sample ID: MW-81S_110821
Lab Sample ID: 240-159739-4
Date Collected: 11/08/21 12:50
Matrix: Water
Date Received: 11/10/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 01:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*66 - 120*		*11/18/21 01:57*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 21:42	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 21:42	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 21:42	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 21:42	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 21:42	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 21:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*111*		*62 - 137*		*11/17/21 21:42*	*1*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*		*11/17/21 21:42*	*1*
Toluene-d8 (Surr)	*100*		*78 - 122*		*11/17/21 21:42*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/17/21 21:42*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159970-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/29/2021 8:46:48 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159970-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159970-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159970-1

Comments
No additional comments.

Receipt
The samples were received on 11/12/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.6º C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) associated with batch 513962 recovered above the upper control limit for Vinyl Chloride. The samples associated with this CCV were non-detect for the affected analyte; therefore, the data have been reported. The associated samples are impacted: TRIP BLANK_115 (240-159970-1), MW-107S_111021 (240-159970-2), MW-82D_111021 (240-159970-3) and MW-82SR_111021 (240-159970-4).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159970-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159970-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159970-1	TRIP BLANK_115	Water	11/10/21 00:00	11/12/21 08:00
240-159970-2	MW-107S_111021	Water	11/10/21 15:20	11/12/21 08:00
240-159970-3	MW-82D_111021	Water	11/10/21 11:25	11/12/21 08:00
240-159970-4	MW-82SR_111021	Water	11/10/21 12:50	11/12/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159970-1

Client Sample ID: TRIP BLANK_115 — Lab Sample ID: 240-159970-1

No Detections.

Client Sample ID: MW-107S_111021 — Lab Sample ID: 240-159970-2

No Detections.

Client Sample ID: MW-82D_111021 — Lab Sample ID: 240-159970-3

No Detections.

Client Sample ID: MW-82SR_111021 — Lab Sample ID: 240-159970-4

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159970-1

Client Sample ID: TRIP BLANK_115
Date Collected: 11/10/21 00:00
Date Received: 11/12/21 08:00

Lab Sample ID: 240-159970-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 21:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 21:06	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 21:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 21:06	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 21:06	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 21:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/20/21 21:06*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/20/21 21:06*	*1*
Toluene-d8 (Surr)	*104*		*78 - 122*		*11/20/21 21:06*	*1*
Dibromofluoromethane (Surr)	*89*		*73 - 120*		*11/20/21 21:06*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159970-1

Client Sample ID: MW-107S_111021
Date Collected: 11/10/21 15:20
Date Received: 11/12/21 08:00

Lab Sample ID: 240-159970-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 22:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*		*11/18/21 22:10*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 21:28	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 21:28	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 21:28	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 21:28	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 21:28	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 21:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/20/21 21:28*	*1*
4-Bromofluorobenzene (Surr)	*72*		*56 - 136*		*11/20/21 21:28*	*1*
Toluene-d8 (Surr)	*105*		*78 - 122*		*11/20/21 21:28*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/20/21 21:28*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159970-1

Client Sample ID: MW-82D_111021

Date Collected: 11/10/21 11:25
Date Received: 11/12/21 08:00

Lab Sample ID: 240-159970-3

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 22:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*		*11/18/21 22:35*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 21:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 21:50	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 21:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 21:50	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 21:50	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 21:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*		*11/20/21 21:50*	*1*
4-Bromofluorobenzene (Surr)	*72*		*56 - 136*		*11/20/21 21:50*	*1*
Toluene-d8 (Surr)	*107*		*78 - 122*		*11/20/21 21:50*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/20/21 21:50*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159970-1

Client Sample ID: MW-82SR_111021
Date Collected: 11/10/21 12:50
Date Received: 11/12/21 08:00

Lab Sample ID: 240-159970-4
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 23:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*		*11/18/21 23:00*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 22:13	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 22:13	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 22:13	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 22:13	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 22:13	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 22:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*107*		*62 - 137*		*11/20/21 22:13*	*1*
4-Bromofluorobenzene (Surr)	*72*		*56 - 136*		*11/20/21 22:13*	*1*
Toluene-d8 (Surr)	*110*		*78 - 122*		*11/20/21 22:13*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/20/21 22:13*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159970-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159970-1	TRIP BLANK_115	99	70	104	89
240-159970-2	MW-107S_111021	105	72	105	99
240-159970-3	MW-82D_111021	103	72	107	94
240-159970-4	MW-82SR_111021	107	72	110	101
240-160095-B-1 MS	Matrix Spike	96	84	113	91
240-160095-B-1 MSD	Matrix Spike Duplicate	95	85	103	88
LCS 240-513962/4	Lab Control Sample	97	79	113	93
MB 240-513962/6	Method Blank	103	76	112	94

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159739-G-3 MS	Matrix Spike	74
240-159739-M-3 MSD	Matrix Spike Duplicate	75
240-159970-2	MW-107S_111021	75
240-159970-3	MW-82D_111021	78
240-159970-4	MW-82SR_111021	77
LCS 240-513700/4	Lab Control Sample	75
MB 240-513700/5	Method Blank	77

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513962/6
Matrix: Water
Analysis Batch: 513962

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 15:30	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 15:30	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 15:30	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 15:30	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 15:30	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 15:30	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*		*11/20/21 15:30*	*1*
4-Bromofluorobenzene (Surr)	*76*		*56 - 136*		*11/20/21 15:30*	*1*
Toluene-d8 (Surr)	*112*		*78 - 122*		*11/20/21 15:30*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/20/21 15:30*	*1*

Lab Sample ID: LCS 240-513962/4
Matrix: Water
Analysis Batch: 513962

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.62		ug/L		96	63 - 134
cis-1,2-Dichloroethene	10.0	10.4		ug/L		104	77 - 123
Tetrachloroethene	10.0	10.5		ug/L		105	76 - 123
trans-1,2-Dichloroethene	10.0	10.2		ug/L		102	75 - 124
Trichloroethene	10.0	8.81		ug/L		88	70 - 122
Vinyl chloride	10.0	10.0		ug/L		100	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*62 - 137*
4-Bromofluorobenzene (Surr)	*79*		*56 - 136*
Toluene-d8 (Surr)	*113*		*78 - 122*
Dibromofluoromethane (Surr)	*93*		*73 - 120*

Lab Sample ID: 240-160095-B-1 MS
Matrix: Water
Analysis Batch: 513962

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	50	U	500	457		ug/L		91	56 - 135
cis-1,2-Dichloroethene	50	U	500	478		ug/L		96	66 - 128
Tetrachloroethene	50	U	500	451		ug/L		90	62 - 131
trans-1,2-Dichloroethene	50	U	500	477		ug/L		95	56 - 136
Trichloroethene	50	U	500	396		ug/L		79	61 - 124
Vinyl chloride	50	U	500	476		ug/L		95	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*
Toluene-d8 (Surr)	*113*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-160095-B-1 MS
Matrix: Water
Analysis Batch: 513962

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Lab Sample ID: 240-160095-B-1 MSD
Matrix: Water
Analysis Batch: 513962

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	50	U	500	486		ug/L		97	56 - 135	6	26
cis-1,2-Dichloroethene	50	U	500	481		ug/L		96	66 - 128	1	14
Tetrachloroethene	50	U	500	459		ug/L		92	62 - 131	2	20
trans-1,2-Dichloroethene	50	U	500	487		ug/L		97	56 - 136	2	15
Trichloroethene	50	U	500	399		ug/L		80	61 - 124	1	15
Vinyl chloride	50	U	500	504		ug/L		101	43 - 157	6	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*95*		*62 - 137*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*
Toluene-d8 (Surr)	*103*		*78 - 122*
Dibromofluoromethane (Surr)	*88*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513700/5
Matrix: Water
Analysis Batch: 513700

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 19:41	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*		*11/18/21 19:41*	*1*

Lab Sample ID: LCS 240-513700/4
Matrix: Water
Analysis Batch: 513700

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.4		ug/L		104	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*

Lab Sample ID: 240-159739-G-3 MS
Matrix: Water
Analysis Batch: 513700

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.4		ug/L		104	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*74*		*66 - 120*

Lab Sample ID: 240-159739-M-3 MSD
Matrix: Water
Analysis Batch: 513700

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153	2	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159970-1

GC/MS VOA

Analysis Batch: 513700

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159970-2	MW-107S_111021	Total/NA	Water	8260B SIM	
240-159970-3	MW-82D_111021	Total/NA	Water	8260B SIM	
240-159970-4	MW-82SR_111021	Total/NA	Water	8260B SIM	
MB 240-513700/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513700/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159739-G-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159739-M-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513962

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159970-1	TRIP BLANK_115	Total/NA	Water	8260B	
240-159970-2	MW-107S_111021	Total/NA	Water	8260B	
240-159970-3	MW-82D_111021	Total/NA	Water	8260B	
240-159970-4	MW-82SR_111021	Total/NA	Water	8260B	
MB 240-513962/6	Method Blank	Total/NA	Water	8260B	
LCS 240-513962/4	Lab Control Sample	Total/NA	Water	8260B	
240-160095-B-1 MS	Matrix Spike	Total/NA	Water	8260B	
240-160095-B-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159970-1

Client Sample ID: TRIP BLANK_115
Lab Sample ID: 240-159970-1
Date Collected: 11/10/21 00:00
Matrix: Water
Date Received: 11/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513962	11/20/21 21:06	LEE	TAL CAN

Client Sample ID: MW-107S_111021
Lab Sample ID: 240-159970-2
Date Collected: 11/10/21 15:20
Matrix: Water
Date Received: 11/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513962	11/20/21 21:28	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513700	11/18/21 22:10	CS	TAL CAN

Client Sample ID: MW-82D_111021
Lab Sample ID: 240-159970-3
Date Collected: 11/10/21 11:25
Matrix: Water
Date Received: 11/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513962	11/20/21 21:50	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513700	11/18/21 22:35	CS	TAL CAN

Client Sample ID: MW-82SR_111021
Lab Sample ID: 240-159970-4
Date Collected: 11/10/21 12:50
Matrix: Water
Date Received: 11/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513962	11/20/21 22:13	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513700	11/18/21 23:00	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159970-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

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Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	☐ DW ☐ NPDES ☐ RCRA Other	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500		Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377		Sampler Name: Sam Hinsdale / COURIER: CHRISTINA WEAVER	TAT if different from below ☐ 10 day ☑ 2 weeks ☐ 3 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client
Phone: 248-994-2240		Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site		Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04					
PO # 30080642.402.04					

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_115	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-107S_111021	11/10/21	15 20		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B
MW-82D_111021	11/10/21	11:25		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B SIM
MW-82SR_111021	11/10/21	12.50		6						6					N	G	X	X	X	X	X	X	X	↓

240-159970 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal ByLab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: Sam Hinsdale	Arcadis	11/10/21 16.45	Received by: NOVI COLD STORAGE	ARCADIS	11/10/21 16:45
Relinquished by:	ARCADIS	11/11/21 0950	Received by:	ETA	11/11/21 0950
Relinquished by:	ETA	11-11-21 1046	Received in Laboratory by: M. A.	ETA	11/12/21 8 00

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11/29/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159970**
Canton Facility

Client Arcadis Site Name

Cooler unpacked by: Matthew Surma

Cooler Received on 11/12/21 Opened on 11/12/21

FedEx 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp 0.5 °C Corrected Cooler Temp. 0.6 °C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2 Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	(No) n.d.d
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?	(Y)	
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13 Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# HC157842
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this	Yes	(No) NA
16 Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ____	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

NO SIM on TB per Corrected COC. DMR 11/12/21

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.

Sample(s) ____ were received in a broken container.

Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.

Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

WI-NC-099

DATA VERIFICATION REPORT

November 29, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159970-1
Sample date: 2021-11-10
Report received by CADENA: 2021-11-29
Initial Data Verification completed by CADENA: 2021-11-29
Number of Samples:4
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch CCV response outliers as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159970-1

		Sample Name:	TRIP BLANK_115				MW-107S_111021				MW-82D_111021				MW-82SR_111021			
		Lab Sample ID:	2401599701				2401599702				2401599703				2401599704			
		Sample Date:	11/10/2021				11/10/2021				11/10/2021				11/10/2021			
	Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC																		
	OSW-8260B																	
	1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	OSW-8260BBSim																	
	1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---	ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

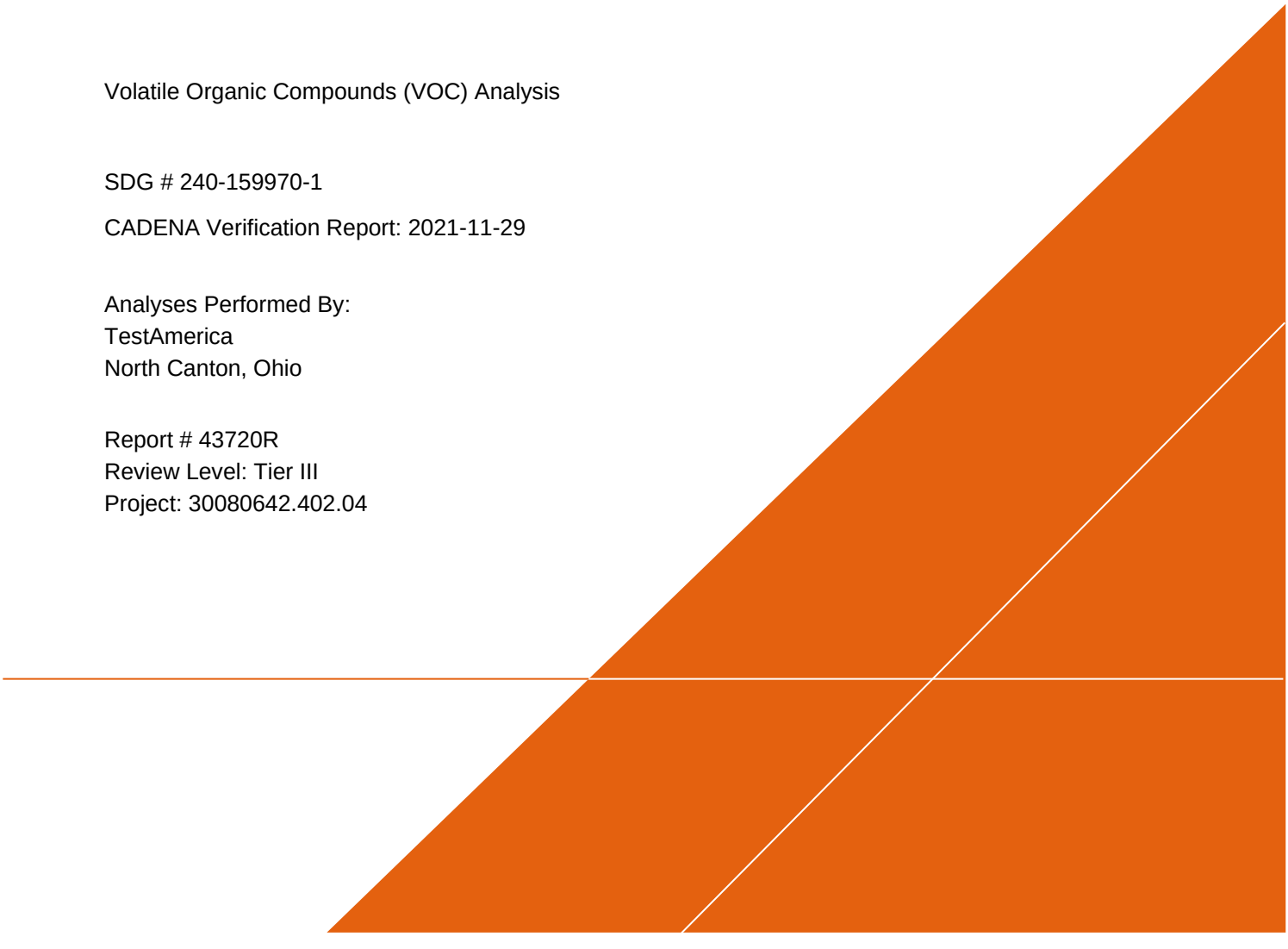
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159970-1

CADENA Verification Report: 2021-11-29

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43720R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159970-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_115	240-159970-1	Water	11/10/21		X	
MW-107S_111021	240-159970-2	Water	11/10/21		X	X
MW-82D_111021	240-159970-3	Water	11/10/21		X	X
MW-82SR_111021	240-159970-4	Water	11/10/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Compound	Criteria
TRIP BLANK_115 MW-107S_111021 MW-82D_111021 MW-82SR_111021	Continuous Calibration Verification %D	Vinyl chloride	+22.0%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J

Initial/Continuing	Criteria	Sample Result	Qualification
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact
Company Name: Arcadis
Address: 28550 Cabot Drive, Suite 500
City/State/Zip: Novi, MI, 48377
Phone: 248-994-2240
Project Name: Ford LTP Off-Site
Project Number: 30080642.402.04
PO # 30080642.402.04

Regulatory program: — DW — NPDES — RCRA Other

Client Project Manager: Kris Hinskey
Telephone: 248-994-2240
Email: kristoffer.hinskey@arcadis.com
Sampler Name: Sam Hinsdale / COURIER: CHRISTINA WEAVER
Method of Shipment/Carrier:
Shipping/Tracking No:

Site Contact: Julia McClafferty
Telephone: 734-644-5131

Lab Contact: Mike DelMonico
Telephone: 330-497-9396

Analysis Turnaround Time
TAT if different from below
10 day ✓ 2 weeks 3 weeks 1 week 2 days 1 day

COC No:
1 of 1 COCs
For lab use only
Walk-in client
Lab sampling
Job/SDG No:

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 6260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_115	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-107S_111021	11/10/21	15 20		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-82D_111021	11/10/21	11:25		6						6					N	G	X	X	X	X	X	X	X	
MW-82SR_111021	11/10/21	12.50		6						6					N	G	X	X	X	X	X	X	X	

240-159970 Chain of Custody

Possible Hazard Identification
✓ Non-Hazard — Flammable — Skin Irritant — Poison B — Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Return to Client ✓ Disposal ByLab Archive For — Months

Special Instructions/QC Requirements & Comments:
Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: Sam Hinsdale	Arcadis	11/10/21 16.45	Received by: NOVI COLD STORAGE	ARCADIS	11/10/21 16.45
Relinquished by:	ARCADIS	11/11/21 0950	Received by:	ETA	11/11/21 0950
Relinquished by:	ETA	11-11-21 1046	Received in Laboratory by: M. A.	ETA	11/12/21 8 00

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11/29/2021

Client Sample ID: TRIP BLANK_115
Lab Sample ID: 240-159970-1
Date Collected: 11/10/21 00:00
Matrix: Water
Date Received: 11/12/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 21:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 21:06	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 21:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 21:06	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 21:06	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 21:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/20/21 21:06*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/20/21 21:06*	*1*
Toluene-d8 (Surr)	*104*		*78 - 122*		*11/20/21 21:06*	*1*
Dibromofluoromethane (Surr)	*89*		*73 - 120*		*11/20/21 21:06*	*1*

Client Sample ID: MW-107S_111021
Lab Sample ID: 240-159970-2
Date Collected: 11/10/21 15:20
Matrix: Water
Date Received: 11/12/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 22:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*		*11/18/21 22:10*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 21:28	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 21:28	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 21:28	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 21:28	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 21:28	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 21:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/20/21 21:28*	*1*
4-Bromofluorobenzene (Surr)	*72*		*56 - 136*		*11/20/21 21:28*	*1*
Toluene-d8 (Surr)	*105*		*78 - 122*		*11/20/21 21:28*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/20/21 21:28*	*1*

Client Sample ID: MW-82D_111021
Lab Sample ID: 240-159970-3
Date Collected: 11/10/21 11:25
Matrix: Water
Date Received: 11/12/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 22:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*		*11/18/21 22:35*	*1*

Client Sample ID: MW-82D_111021
Lab Sample ID: 240-159970-3
Date Collected: 11/10/21 11:25
Matrix: Water
Date Received: 11/12/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 21:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 21:50	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 21:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 21:50	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 21:50	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 21:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*		*11/20/21 21:50*	*1*
4-Bromofluorobenzene (Surr)	*72*		*56 - 136*		*11/20/21 21:50*	*1*
Toluene-d8 (Surr)	*107*		*78 - 122*		*11/20/21 21:50*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/20/21 21:50*	*1*

Client Sample ID: MW-82SR_111021
Lab Sample ID: 240-159970-4
Date Collected: 11/10/21 12:50
Matrix: Water
Date Received: 11/12/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 23:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*		*11/18/21 23:00*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 22:13	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 22:13	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 22:13	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 22:13	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 22:13	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 22:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*107*		*62 - 137*		*11/20/21 22:13*	*1*
4-Bromofluorobenzene (Surr)	*72*		*56 - 136*		*11/20/21 22:13*	*1*
Toluene-d8 (Surr)	*110*		*78 - 122*		*11/20/21 22:13*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/20/21 22:13*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-160086-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/29/2021 8:50:56 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160086-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
E	Result exceeded calibration range.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160086-1

Job ID: 240-160086-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-160086-1

Comments
No additional comments.

Receipt
The samples were received on 11/15/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.5º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160086-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160086-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-160086-1	TRIP BLANK_152	Water	11/11/21 00:00	11/15/21 08:00
240-160086-2	MW-83_111121	Water	11/11/21 11:10	11/15/21 08:00
240-160086-3	MW-83S_111121	Water	11/11/21 12:40	11/15/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160086-1

Client Sample ID: TRIP BLANK_152 — Lab Sample ID: 240-160086-1

No Detections.

Client Sample ID: MW-83_111121 — Lab Sample ID: 240-160086-2

No Detections.

Client Sample ID: MW-83S_111121 — Lab Sample ID: 240-160086-3

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160086-1

Client Sample ID: TRIP BLANK_152

Lab Sample ID: 240-160086-1

Date Collected: 11/11/21 00:00

Matrix: Water

Date Received: 11/15/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/22/21 19:54	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/22/21 19:54	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/22/21 19:54	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/22/21 19:54	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/22/21 19:54	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/22/21 19:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/22/21 19:54*	*1*
4-Bromofluorobenzene (Surr)	*96*		*56 - 136*		*11/22/21 19:54*	*1*
Toluene-d8 (Surr)	*105*		*78 - 122*		*11/22/21 19:54*	*1*
Dibromofluoromethane (Surr)	*114*		*73 - 120*		*11/22/21 19:54*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160086-1

Client Sample ID: MW-83_111121
Date Collected: 11/11/21 11:10
Date Received: 11/15/21 08:00

Lab Sample ID: 240-160086-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 23:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*76*		*66 - 120*		*11/18/21 23:50*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/22/21 21:28	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/22/21 21:28	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/22/21 21:28	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/22/21 21:28	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/22/21 21:28	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/22/21 21:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*		*11/22/21 21:28*	*1*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*		*11/22/21 21:28*	*1*
Toluene-d8 (Surr)	*105*		*78 - 122*		*11/22/21 21:28*	*1*
Dibromofluoromethane (Surr)	*112*		*73 - 120*		*11/22/21 21:28*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160086-1

Client Sample ID: MW-83S_111121
Date Collected: 11/11/21 12:40
Date Received: 11/15/21 08:00

Lab Sample ID: 240-160086-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/19/21 00:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*66 - 120*		*11/19/21 00:15*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/22/21 21:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/22/21 21:52	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/22/21 21:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/22/21 21:52	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/22/21 21:52	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/22/21 21:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*62 - 137*		*11/22/21 21:52*	*1*
4-Bromofluorobenzene (Surr)	*97*		*56 - 136*		*11/22/21 21:52*	*1*
Toluene-d8 (Surr)	*104*		*78 - 122*		*11/22/21 21:52*	*1*
Dibromofluoromethane (Surr)	*111*		*73 - 120*		*11/22/21 21:52*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160086-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159807-B-1 MS	Matrix Spike	101	100	109	115
240-159807-B-1 MSD	Matrix Spike Duplicate	98	99	109	112
240-160086-1	TRIP BLANK_152	105	96	105	114
240-160086-2	MW-83_111121	102	94	105	112
240-160086-3	MW-83S_111121	104	97	104	111
LCS 240-514100/5	Lab Control Sample	105	102	109	115
MB 240-514100/8	Method Blank	103	98	109	114

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159739-G-3 MS	Matrix Spike	74
240-159739-M-3 MSD	Matrix Spike Duplicate	75
240-160086-2	MW-83_111121	76
240-160086-3	MW-83S_111121	79
LCS 240-513700/4	Lab Control Sample	75
MB 240-513700/5	Method Blank	77

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-514100/8
Matrix: Water
Analysis Batch: 514100

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/22/21 13:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/22/21 13:57	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/22/21 13:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/22/21 13:57	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/22/21 13:57	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/22/21 13:57	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*		*11/22/21 13:57*	*1*
4-Bromofluorobenzene (Surr)	*98*		*56 - 136*		*11/22/21 13:57*	*1*
Toluene-d8 (Surr)	*109*		*78 - 122*		*11/22/21 13:57*	*1*
Dibromofluoromethane (Surr)	*114*		*73 - 120*		*11/22/21 13:57*	*1*

Lab Sample ID: LCS 240-514100/5
Matrix: Water
Analysis Batch: 514100

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	27.2		ug/L		109	63 - 134
cis-1,2-Dichloroethene	25.0	24.6		ug/L		98	77 - 123
Tetrachloroethene	25.0	26.8		ug/L		107	76 - 123
trans-1,2-Dichloroethene	25.0	25.7		ug/L		103	75 - 124
Trichloroethene	25.0	26.2		ug/L		105	70 - 122
Vinyl chloride	25.0	21.7		ug/L		87	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*
4-Bromofluorobenzene (Surr)	*102*		*56 - 136*
Toluene-d8 (Surr)	*109*		*78 - 122*
Dibromofluoromethane (Surr)	*115*		*73 - 120*

Lab Sample ID: 240-159807-B-1 MS
Matrix: Water
Analysis Batch: 514100

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,2-Dichloroethene	130		83.3	200		ug/L		90	66 - 128
Tetrachloroethene	120		83.3	212	E	ug/L		105	62 - 131
trans-1,2-Dichloroethene	4.3		83.3	89.0		ug/L		102	56 - 136
Trichloroethene	7.8		83.3	94.6		ug/L		104	61 - 124
Vinyl chloride	3.3	U	83.3	68.5		ug/L		82	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*101*		*62 - 137*
4-Bromofluorobenzene (Surr)	*100*		*56 - 136*
Toluene-d8 (Surr)	*109*		*78 - 122*
Dibromofluoromethane (Surr)	*115*		*73 - 120*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159807-B-1 MSD
Matrix: Water
Analysis Batch: 514100

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
cis-1,2-Dichloroethene	130		83.3	197		ug/L		86	66 - 128	1	14
Tetrachloroethene	120		83.3	211	E	ug/L		104	62 - 131	0	20
trans-1,2-Dichloroethene	4.3		83.3	85.6		ug/L		98	56 - 136	4	15
Trichloroethene	7.8		83.3	92.6		ug/L		102	61 - 124	2	15
Vinyl chloride	3.3	U	83.3	69.8		ug/L		84	43 - 157	2	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*
4-Bromofluorobenzene (Surr)	*99*		*56 - 136*
Toluene-d8 (Surr)	*109*		*78 - 122*
Dibromofluoromethane (Surr)	*112*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513700/5
Matrix: Water
Analysis Batch: 513700

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 19:41	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*		*11/18/21 19:41*	*1*

Lab Sample ID: LCS 240-513700/4
Matrix: Water
Analysis Batch: 513700

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.4		ug/L		104	80 - 122		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*

Lab Sample ID: 240-159739-G-3 MS
Matrix: Water
Analysis Batch: 513700

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U F1	10.0	10.4		ug/L		104	51 - 153		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*74*		*66 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159739-M-3 MSD
Matrix: Water
Analysis Batch: 513700

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153	2	16

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160086-1

GC/MS VOA

Analysis Batch: 513700

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-160086-2	MW-83_111121	Total/NA	Water	8260B SIM	
240-160086-3	MW-83S_111121	Total/NA	Water	8260B SIM	
MB 240-513700/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513700/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159739-G-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159739-M-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 514100

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-160086-1	TRIP BLANK_152	Total/NA	Water	8260B	
240-160086-2	MW-83_111121	Total/NA	Water	8260B	
240-160086-3	MW-83S_111121	Total/NA	Water	8260B	
MB 240-514100/8	Method Blank	Total/NA	Water	8260B	
LCS 240-514100/5	Lab Control Sample	Total/NA	Water	8260B	
240-159807-B-1 MS	Matrix Spike	Total/NA	Water	8260B	
240-159807-B-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160086-1

Client Sample ID: TRIP BLANK_152

Lab Sample ID: 240-160086-1
Date Collected: 11/11/21 00:00
Matrix: Water
Date Received: 11/15/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	514100	11/22/21 19:54	SAM	TAL CAN

Client Sample ID: MW-83_111121

Lab Sample ID: 240-160086-2
Date Collected: 11/11/21 11:10
Matrix: Water
Date Received: 11/15/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	514100	11/22/21 21:28	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	513700	11/18/21 23:50	CS	TAL CAN

Client Sample ID: MW-83S_111121

Lab Sample ID: 240-160086-3
Date Collected: 11/11/21 12:40
Matrix: Water
Date Received: 11/15/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	514100	11/22/21 21:52	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	513700	11/19/21 00:15	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160086-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Sam Hindle / COURIER: CHRISTINA WEAVER		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30080642.402.04	Shipping/Tracking No:		
PO # 30080642.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below: 10 day; 3 weeks; 2 weeks; 1 week; 2 days; 1 day

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_152	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-83_111121	11/11/21	11:10		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-83S_111121	11/11/21	12:40		6						6					N	G	X	X	X	X	X	X	X	

240-160086 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
SH [signature]	Arcadis	11/11/21 14:10	NOVI COLD STORAGE	ARCADIS	11/11/21 / 1410
[signature]	ARCADIS	11/12/21 / 1000	[signature]	GTL	11/12/21 / 1000
[signature]	GTL	11/12/21 1000	Received in Laboratory by: [signature]	ETA	11-13-21 0800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 160086
Canton Facility

Client Arcadis Site Name

Cooler unpacked by:

Cooler Received on 11-13-21 Opened on 11-13-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 1.4 °C Corrected Cooler Temp. 1.5 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC157842
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #	Yes	No
17. Was a LL Hg or Me Hg trip blank present?	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

No SIM on TB per corrected CoC.

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container.
Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.
Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

WI-NC-099

DATA VERIFICATION REPORT

November 29, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 160086-1
Sample date: 2021-11-11
Report received by CADENA: 2021-11-29
Initial Data Verification completed by CADENA: 2021-11-29
Number of Samples:3
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 160086-1

		Sample Name:	TRIP BLANK_152				MW-83_111121				MW-83S_111121			
		Lab Sample ID:	2401600861				2401600862				2401600863			
		Sample Date:	11/11/2021				11/11/2021				11/11/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC													
OSW-8260B													
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim													
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

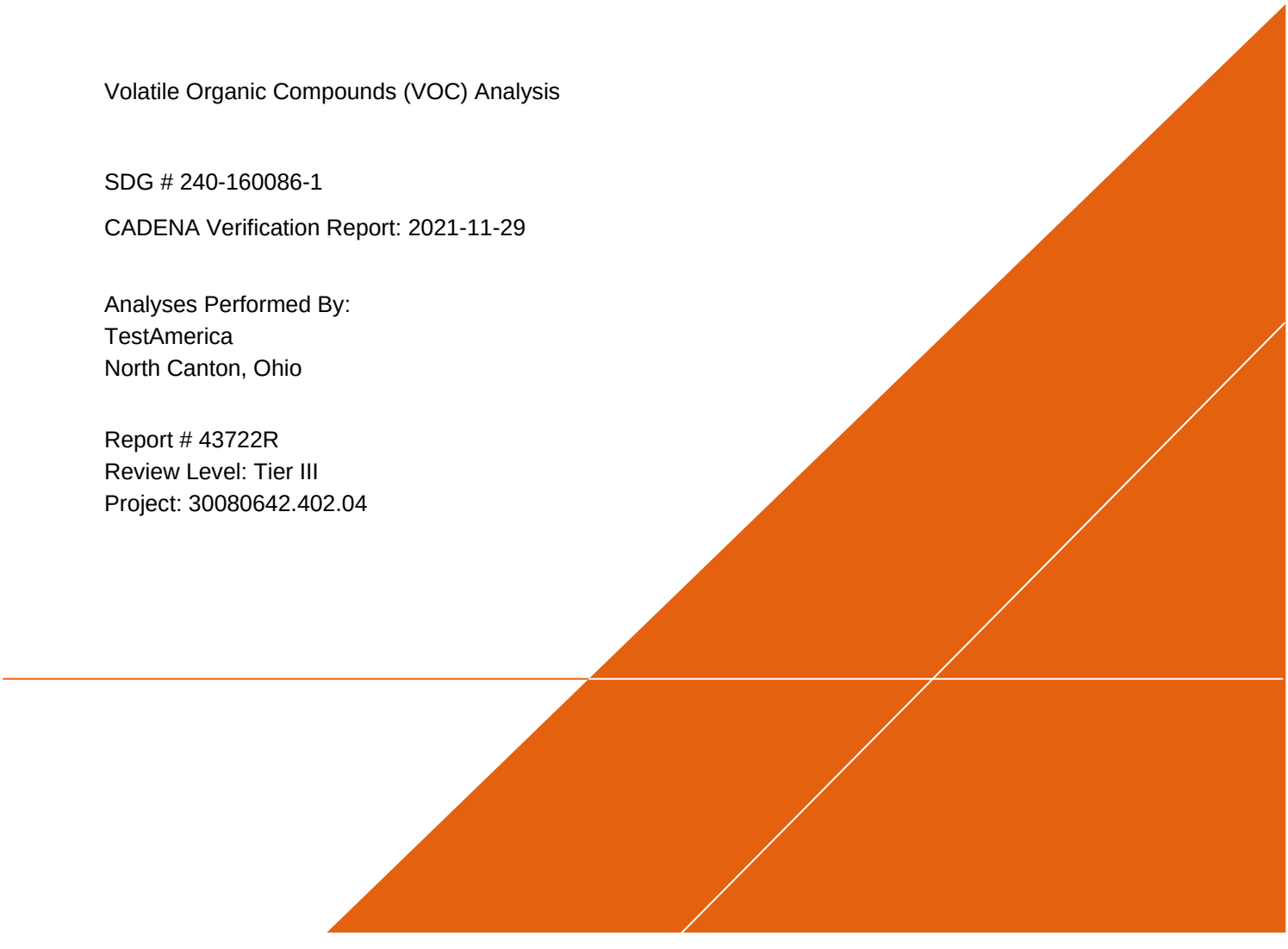
Volatile Organic Compounds (VOC) Analysis

SDG # 240-160086-1

CADENA Verification Report: 2021-11-29

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43722R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-160086-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_152	240-160086-1	Water	11/11/21		X	
MW-83_111121	240-160086-2	Water	11/11/21		X	X
MW-83S_111121	240-160086-3	Water	11/11/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Sam Hindley / COURIER: CHRISTINA WEAVER		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30080642.402.04	Shipping/Tracking No:		
PO # 30080642.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below: 10 day; 3 weeks; 2 weeks; 1 week; 2 days; 1 day

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_152	—	—		X						1					N	G	X	X	X	X	X	X	~~X~~ (W)	1 Trip Blank
MW-83_111121	11/11/21	11:10		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B
MW-83S_111121	11/11/21	12:40		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B SIM

240-160086 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
SH [signature]	Arcadis	11/11/21 14:10	NOVI COLD STORAGE	ARCADIS	11/11/21 / 1410
[signature]	ARCADIS	11/12/21 / 1000	[signature]	GTL	11/12/21 / 1000
[signature]	GTL	11/12/21 1000	Received in Laboratory by: Adam Gennett	GTL	11-13-21 0800

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Client Sample ID: TRIP BLANK_152
Lab Sample ID: 240-160086-1
Date Collected: 11/11/21 00:00
Matrix: Water
Date Received: 11/15/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/22/21 19:54	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/22/21 19:54	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/22/21 19:54	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/22/21 19:54	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/22/21 19:54	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/22/21 19:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/22/21 19:54*	*1*
4-Bromofluorobenzene (Surr)	*96*		*56 - 136*		*11/22/21 19:54*	*1*
Toluene-d8 (Surr)	*105*		*78 - 122*		*11/22/21 19:54*	*1*
Dibromofluoromethane (Surr)	*114*		*73 - 120*		*11/22/21 19:54*	*1*

Client Sample ID: MW-83_111121
Lab Sample ID: 240-160086-2
Date Collected: 11/11/21 11:10
Matrix: Water
Date Received: 11/15/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 23:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*76*		*66 - 120*		*11/18/21 23:50*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/22/21 21:28	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/22/21 21:28	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/22/21 21:28	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/22/21 21:28	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/22/21 21:28	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/22/21 21:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*		*11/22/21 21:28*	*1*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*		*11/22/21 21:28*	*1*
Toluene-d8 (Surr)	*105*		*78 - 122*		*11/22/21 21:28*	*1*
Dibromofluoromethane (Surr)	*112*		*73 - 120*		*11/22/21 21:28*	*1*

Client Sample ID: MW-83S_111121
Lab Sample ID: 240-160086-3
Date Collected: 11/11/21 12:40
Matrix: Water
Date Received: 11/15/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/19/21 00:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*66 - 120*		*11/19/21 00:15*	*1*

Client Sample ID: MW-83S_111121
Lab Sample ID: 240-160086-3

Date Collected: 11/11/21 12:40
Matrix: Water

Date Received: 11/15/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/22/21 21:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/22/21 21:52	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/22/21 21:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/22/21 21:52	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/22/21 21:52	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/22/21 21:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*62 - 137*		*11/22/21 21:52*	*1*
4-Bromofluorobenzene (Surr)	*97*		*56 - 136*		*11/22/21 21:52*	*1*
Toluene-d8 (Surr)	*104*		*78 - 122*		*11/22/21 21:52*	*1*
Dibromofluoromethane (Surr)	*111*		*73 - 120*		*11/22/21 21:52*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159846-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/26/2021 7:58:19 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159846-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159846-1

Job ID: 240-159846-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159846-1

Comments
No additional comments.

Receipt
The samples were received on 11/11/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 4.6º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159846-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159846-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159846-1	TRIP BLANK_108	Water	11/09/21 00:00	11/11/21 08:00
240-159846-2	MW-86_110921	Water	11/09/21 15:05	11/11/21 08:00
240-159846-3	MW-86S_110921	Water	11/09/21 16:10	11/11/21 08:00
240-159846-4	MW-134S_110921	Water	11/09/21 12:35	11/11/21 08:00
240-159846-5	MW-84S_110921	Water	11/09/21 11:25	11/11/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159846-1

Client Sample ID: TRIP BLANK_108 — Lab Sample ID: 240-159846-1

No Detections.

Client Sample ID: MW-86_110921 — Lab Sample ID: 240-159846-2

No Detections.

Client Sample ID: MW-86S_110921 — Lab Sample ID: 240-159846-3

No Detections.

Client Sample ID: MW-134S_110921 — Lab Sample ID: 240-159846-4

No Detections.

Client Sample ID: MW-84S_110921 — Lab Sample ID: 240-159846-5

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159846-1

Client Sample ID: TRIP BLANK_108

Date Collected: 11/09/21 00:00
Date Received: 11/11/21 08:00

Lab Sample ID: 240-159846-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 17:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 17:38	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 17:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 17:38	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 17:38	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 17:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*62 - 137*		*11/18/21 17:38*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/18/21 17:38*	*1*
Toluene-d8 (Surr)	*92*		*78 - 122*		*11/18/21 17:38*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/18/21 17:38*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159846-1

Client Sample ID: MW-86_110921
Date Collected: 11/09/21 15:05
Date Received: 11/11/21 08:00

Lab Sample ID: 240-159846-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/13/21 02:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*		*11/13/21 02:24*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 20:09	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 20:09	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 20:09	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 20:09	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 20:09	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 20:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*62 - 137*		*11/18/21 20:09*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/18/21 20:09*	*1*
Toluene-d8 (Surr)	*92*		*78 - 122*		*11/18/21 20:09*	*1*
Dibromofluoromethane (Surr)	*97*		*73 - 120*		*11/18/21 20:09*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159846-1

Client Sample ID: MW-86S_110921
Date Collected: 11/09/21 16:10
Date Received: 11/11/21 08:00

Lab Sample ID: 240-159846-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/13/21 02:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*66 - 120*		*11/13/21 02:49*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 20:34	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 20:34	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 20:34	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 20:34	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 20:34	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 20:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/18/21 20:34*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/18/21 20:34*	*1*
Toluene-d8 (Surr)	*94*		*78 - 122*		*11/18/21 20:34*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/18/21 20:34*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159846-1

Client Sample ID: MW-134S_110921
Date Collected: 11/09/21 12:35
Date Received: 11/11/21 08:00

Lab Sample ID: 240-159846-4
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/13/21 03:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*		*11/13/21 03:14*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 20:59	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 20:59	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 20:59	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 20:59	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 20:59	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 20:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*62 - 137*		*11/18/21 20:59*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/18/21 20:59*	*1*
Toluene-d8 (Surr)	*94*		*78 - 122*		*11/18/21 20:59*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/18/21 20:59*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159846-1

Client Sample ID: MW-84S_110921
Date Collected: 11/09/21 11:25
Date Received: 11/11/21 08:00

Lab Sample ID: 240-159846-5
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/13/21 03:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*		*11/13/21 03:39*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 21:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 21:24	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 21:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 21:24	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 21:24	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 21:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/18/21 21:24*	*1*
4-Bromofluorobenzene (Surr)	*80*		*56 - 136*		*11/18/21 21:24*	*1*
Toluene-d8 (Surr)	*94*		*78 - 122*		*11/18/21 21:24*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/18/21 21:24*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159846-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159846-1	TRIP BLANK_108	91	82	92	98
240-159846-2	MW-86_110921	91	81	92	97
240-159846-3	MW-86S_110921	93	81	94	100
240-159846-4	MW-134S_110921	94	81	94	101
240-159846-5	MW-84S_110921	93	80	94	101
240-159848-E-3 MS	Matrix Spike	89	93	92	95
240-159848-E-3 MSD	Matrix Spike Duplicate	86	95	94	94
LCS 240-513621/5	Lab Control Sample	87	90	95	94
MB 240-513621/8	Method Blank	90	84	93	99

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159541-G-2 MS	Matrix Spike	77
240-159541-M-2 MSD	Matrix Spike Duplicate	78
240-159846-2	MW-86_110921	77
240-159846-3	MW-86S_110921	79
240-159846-4	MW-134S_110921	75
240-159846-5	MW-84S_110921	78
LCS 240-512785/4	Lab Control Sample	79
MB 240-512785/5	Method Blank	79

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513621/8
Matrix: Water
Analysis Batch: 513621

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 15:31	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 15:31	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 15:31	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 15:31	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 15:31	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 15:31	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*		*11/18/21 15:31*	*1*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*		*11/18/21 15:31*	*1*
Toluene-d8 (Surr)	*93*		*78 - 122*		*11/18/21 15:31*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/18/21 15:31*	*1*

Lab Sample ID: LCS 240-513621/5
Matrix: Water
Analysis Batch: 513621

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	26.8		ug/L		107	63 - 134
cis-1,2-Dichloroethene	25.0	24.6		ug/L		99	77 - 123
Tetrachloroethene	25.0	26.5		ug/L		106	76 - 123
trans-1,2-Dichloroethene	25.0	25.6		ug/L		102	75 - 124
Trichloroethene	25.0	25.5		ug/L		102	70 - 122
Vinyl chloride	25.0	20.1		ug/L		81	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*87*		*62 - 137*
4-Bromofluorobenzene (Surr)	*90*		*56 - 136*
Toluene-d8 (Surr)	*95*		*78 - 122*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: 240-159848-E-3 MS
Matrix: Water
Analysis Batch: 513621

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	2.0	U	50.0	52.2		ug/L		104	56 - 135
cis-1,2-Dichloroethene	2.0	U	50.0	52.0		ug/L		104	66 - 128
Tetrachloroethene	2.0	U	50.0	56.8		ug/L		114	62 - 131
trans-1,2-Dichloroethene	2.0	U	50.0	51.2		ug/L		102	56 - 136
Trichloroethene	2.0	U	50.0	51.9		ug/L		104	61 - 124
Vinyl chloride	2.0	U	50.0	41.8		ug/L		84	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*62 - 137*
4-Bromofluorobenzene (Surr)	*93*		*56 - 136*
Toluene-d8 (Surr)	*92*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159848-E-3 MS
Matrix: Water
Analysis Batch: 513621

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*95*		*73 - 120*

Lab Sample ID: 240-159848-E-3 MSD
Matrix: Water
Analysis Batch: 513621

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	2.0	U	50.0	49.7		ug/L		99	56 - 135	5	26
cis-1,2-Dichloroethene	2.0	U	50.0	48.6		ug/L		97	66 - 128	7	14
Tetrachloroethene	2.0	U	50.0	55.3		ug/L		111	62 - 131	3	20
trans-1,2-Dichloroethene	2.0	U	50.0	48.6		ug/L		97	56 - 136	5	15
Trichloroethene	2.0	U	50.0	49.9		ug/L		100	61 - 124	4	15
Vinyl chloride	2.0	U	50.0	38.6		ug/L		77	43 - 157	8	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*
4-Bromofluorobenzene (Surr)	*95*		*56 - 136*
Toluene-d8 (Surr)	*94*		*78 - 122*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512785/5
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 18:32	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*66 - 120*		*11/12/21 18:32*	*1*

Lab Sample ID: LCS 240-512785/4
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.7		ug/L		107	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*66 - 120*

Lab Sample ID: 240-159541-G-2 MS
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

Lab Sample ID: 240-159541-M-2 MSD
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.4		ug/L		104	51 - 153	2	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159846-1

GC/MS VOA

Analysis Batch: 512785

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159846-2	MW-86_110921	Total/NA	Water	8260B SIM	
240-159846-3	MW-86S_110921	Total/NA	Water	8260B SIM	
240-159846-4	MW-134S_110921	Total/NA	Water	8260B SIM	
240-159846-5	MW-84S_110921	Total/NA	Water	8260B SIM	
MB 240-512785/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512785/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159541-G-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159541-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513621

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159846-1	TRIP BLANK_108	Total/NA	Water	8260B	
240-159846-2	MW-86_110921	Total/NA	Water	8260B	
240-159846-3	MW-86S_110921	Total/NA	Water	8260B	
240-159846-4	MW-134S_110921	Total/NA	Water	8260B	
240-159846-5	MW-84S_110921	Total/NA	Water	8260B	
MB 240-513621/8	Method Blank	Total/NA	Water	8260B	
LCS 240-513621/5	Lab Control Sample	Total/NA	Water	8260B	
240-159848-E-3 MS	Matrix Spike	Total/NA	Water	8260B	
240-159848-E-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159846-1

Client Sample ID: TRIP BLANK_108
Lab Sample ID: 240-159846-1
Date Collected: 11/09/21 00:00
Matrix: Water
Date Received: 11/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513621	11/18/21 17:38	SAM	TAL CAN

Client Sample ID: MW-86_110921
Lab Sample ID: 240-159846-2
Date Collected: 11/09/21 15:05
Matrix: Water
Date Received: 11/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513621	11/18/21 20:09	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	512785	11/13/21 02:24	CS	TAL CAN

Client Sample ID: MW-86S_110921
Lab Sample ID: 240-159846-3
Date Collected: 11/09/21 16:10
Matrix: Water
Date Received: 11/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513621	11/18/21 20:34	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	512785	11/13/21 02:49	CS	TAL CAN

Client Sample ID: MW-134S_110921
Lab Sample ID: 240-159846-4
Date Collected: 11/09/21 12:35
Matrix: Water
Date Received: 11/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513621	11/18/21 20:59	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	512785	11/13/21 03:14	CS	TAL CAN

Client Sample ID: MW-84S_110921
Lab Sample ID: 240-159846-5
Date Collected: 11/09/21 11:25
Matrix: Water
Date Received: 11/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513621	11/18/21 21:24	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	512785	11/13/21 03:39	CS	TAL CAN

Laboratory References:
TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159846-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Regulatory program: DW NPDES RCRA Other

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Sam Hindle	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 108	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-86_110921	11/9/21	15:05		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-86S_110921	11/9/21	16:10		6						6					N	G	X	X	X	X	X	X	X	
MW-134S_110921	11/9/21	12:35		6						6					N	G	X	X	X	X	X	X	X	
MW-84S_110921	11/9/21	11:25		6						6					N	G	X	X	X	X	X	X	X	

240-159846 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are r: Return to Client; Disposal By Lab

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
SH	Arcadis	11/9/21 18:30	Novi Cold Storage	Arcadis	11/9/21 18:30
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Arcadis	11/10/21		GTA	11/10/21 1084
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
	GTA	11/10/21 1044		ETA	11-11-21 806

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11/26/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159846**
Canton Facility

Client Arcadis Site Name

Cooler Received on 11-11-21 Opened on 11-11-21

Cooler unpacked by: Tanya Berg

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: ~~Bubble Wrap~~ Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 4.5 °C Corrected Cooler Temp. 4.6 °C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?	(Yes)	No
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# HC157842
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 60358	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present?	Yes	(No)

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

No SMA on TB per corrected COC. DMB 11-11-21

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.

Sample(s) ____ were received in a broken container.

Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.

Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

WI-NC-099

DATA VERIFICATION REPORT

November 26, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159846-1
Sample date: 2021-11-09
Report received by CADENA: 2021-11-26
Initial Data Verification completed by CADENA: 2021-11-26
Number of Samples:5
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159846-1

	Sample Name:	TRIP BLANK_108				MW-86_110921				MW-86S_110921				MW-134S_110921				MW-84S_110921			
	Lab Sample ID:	2401598461				2401598462				2401598463				2401598464				2401598465			
	Sample Date:	11/9/2021				11/9/2021				11/9/2021				11/9/2021				11/9/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC																					
OSW-8260B																					
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim																					
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---	ND	2.0	ug/l	---	ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

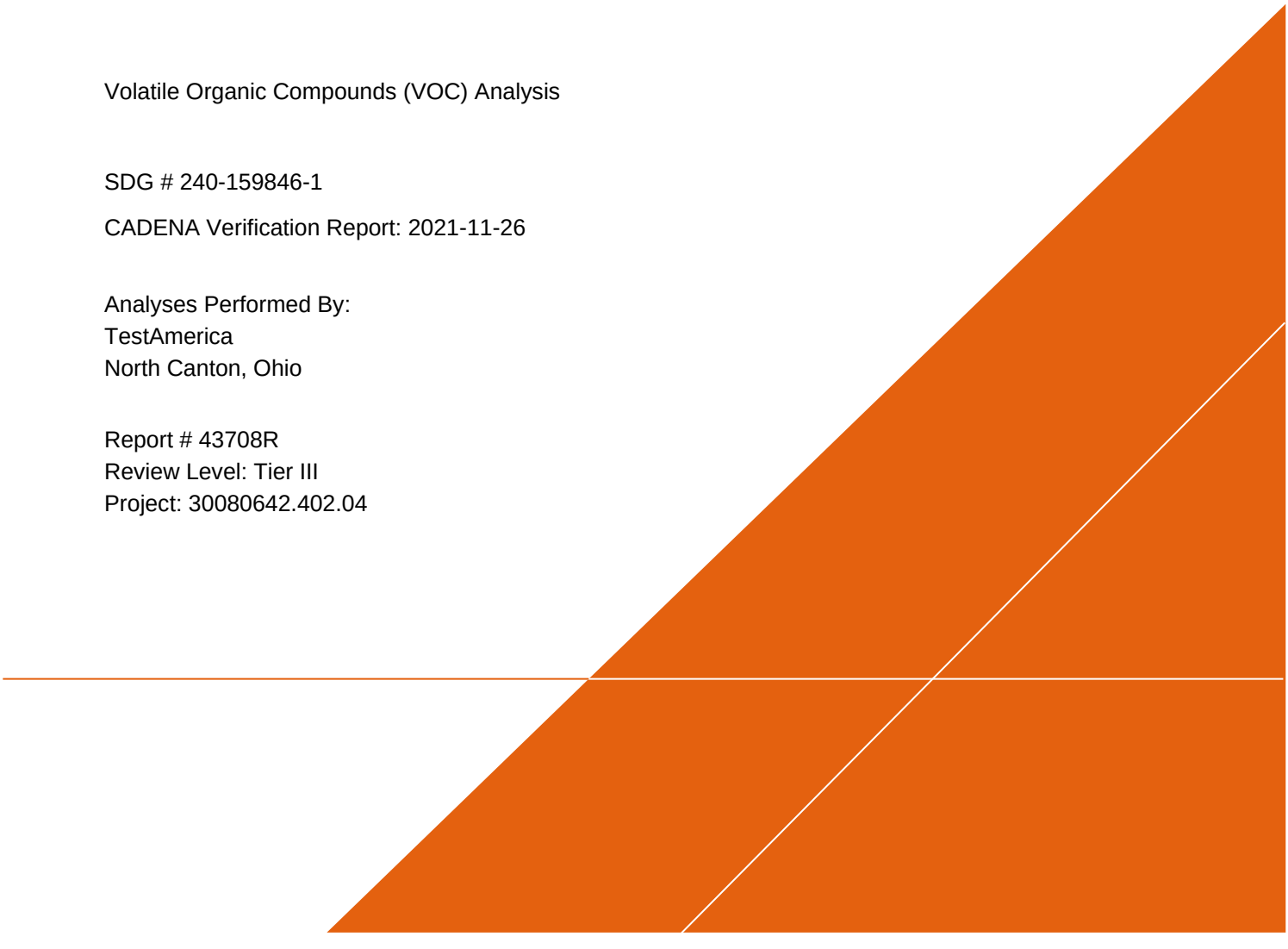
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159846-1

CADENA Verification Report: 2021-11-26

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43708R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159846-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_108	240-159846-1	Water	11/09/21		X	
MW-86_110921	240-159846-2	Water	11/09/21		X	X
MW-86S_110921	240-159846-3	Water	11/09/21		X	X
MW-134S_110921	240-159846-4	Water	11/09/21		X	X
MW-84S_110921	240-159846-5	Water	11/09/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 14, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 14, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Sam Hindle	TAT if different from below: 10 day; ✓ 2 weeks; 3 weeks; 1 week; 2 days; 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 108	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-86D_110921	11/9/21	15:05		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-86S_110921	11/9/21	16:10		6						6					N	G	X	X	X	X	X	X	X	
MW-134S_110921	11/9/21	12:35		6						6					N	G	X	X	X	X	X	X	X	
MW-84S_110921	11/9/21	11:25		6						6					N	G	X	X	X	X	X	X	X	

240-159846 Chain of Custody

Possible Hazard Identification
✓ Non-Hazard — Flammable — Skin Irritant — Poison B — Unknown

Sample Disposal (A fee may be assessed if samples are r
— Return to Client ✓ Disposal By Lab

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Sam Hindle	Arcadis	11/9/21 18:30	Novi Cold Storage	Arcadis	11/9/21 18:30
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Arcadis	11/10/21		GTA	11/10/21 1084
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
	GTA	11/10/21 1084		ETA	11-11-21 806

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11/26/2021

Client Sample ID: TRIP BLANK_108
Lab Sample ID: 240-159846-1
Date Collected: 11/09/21 00:00
Matrix: Water
Date Received: 11/11/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 17:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 17:38	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 17:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 17:38	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 17:38	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 17:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*62 - 137*		*11/18/21 17:38*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/18/21 17:38*	*1*
Toluene-d8 (Surr)	*92*		*78 - 122*		*11/18/21 17:38*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/18/21 17:38*	*1*

Client Sample ID: MW-86_110921
Lab Sample ID: 240-159846-2
Date Collected: 11/09/21 15:05
Matrix: Water
Date Received: 11/11/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/13/21 02:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*		*11/13/21 02:24*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 20:09	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 20:09	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 20:09	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 20:09	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 20:09	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 20:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*62 - 137*		*11/18/21 20:09*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/18/21 20:09*	*1*
Toluene-d8 (Surr)	*92*		*78 - 122*		*11/18/21 20:09*	*1*
Dibromofluoromethane (Surr)	*97*		*73 - 120*		*11/18/21 20:09*	*1*

Client Sample ID: MW-86S_110921
Lab Sample ID: 240-159846-3
Date Collected: 11/09/21 16:10
Matrix: Water
Date Received: 11/11/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/13/21 02:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*66 - 120*		*11/13/21 02:49*	*1*

Client Sample ID: MW-86S_110921
Lab Sample ID: 240-159846-3
Date Collected: 11/09/21 16:10
Matrix: Water
Date Received: 11/11/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 20:34	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 20:34	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 20:34	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 20:34	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 20:34	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 20:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/18/21 20:34*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/18/21 20:34*	*1*
Toluene-d8 (Surr)	*94*		*78 - 122*		*11/18/21 20:34*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/18/21 20:34*	*1*

Client Sample ID: MW-134S_110921
Lab Sample ID: 240-159846-4
Date Collected: 11/09/21 12:35
Matrix: Water
Date Received: 11/11/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/13/21 03:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*		*11/13/21 03:14*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 20:59	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 20:59	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 20:59	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 20:59	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 20:59	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 20:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*62 - 137*		*11/18/21 20:59*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/18/21 20:59*	*1*
Toluene-d8 (Surr)	*94*		*78 - 122*		*11/18/21 20:59*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/18/21 20:59*	*1*

Client Sample ID: MW-84S_110921
Lab Sample ID: 240-159846-5
Date Collected: 11/09/21 11:25
Matrix: Water
Date Received: 11/11/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/13/21 03:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*		*11/13/21 03:39*	*1*

Client Sample ID: MW-84S_110921
Lab Sample ID: 240-159846-5

Date Collected: 11/09/21 11:25
Matrix: Water

Date Received: 11/11/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 21:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 21:24	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 21:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 21:24	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 21:24	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 21:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/18/21 21:24*	*1*
4-Bromofluorobenzene (Surr)	*80*		*56 - 136*		*11/18/21 21:24*	*1*
Toluene-d8 (Surr)	*94*		*78 - 122*		*11/18/21 21:24*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/18/21 21:24*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159141-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/17/2021 10:51:48 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159141-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159141-1

Job ID: 240-159141-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159141-1

Comments
No additional comments.

Receipt
The samples were received on 11/3/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.2º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159141-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159141-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159141-1	TRIP BLANK_02	Water	11/01/21 00:00	11/03/21 08:00
240-159141-2	MW-108S_110121	Water	11/01/21 11:15	11/03/21 08:00
240-159141-3	MW-85SR_110121	Water	11/01/21 13:20	11/03/21 08:00
240-159141-4	MW-85_110121	Water	11/01/21 14:40	11/03/21 08:00
240-159141-5	DUP-06	Water	11/01/21 00:00	11/03/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159141-1

Client Sample ID: TRIP BLANK_02 — Lab Sample ID: 240-159141-1

No Detections.

Client Sample ID: MW-108S_110121 — Lab Sample ID: 240-159141-2

No Detections.

Client Sample ID: MW-85SR_110121 — Lab Sample ID: 240-159141-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	0.69	J	1.0	0.45	ug/L	1		8260B	Total/NA

Client Sample ID: MW-85_110121 — Lab Sample ID: 240-159141-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	4.8		1.0	0.45	ug/L	1		8260B	Total/NA

Client Sample ID: DUP-06 — Lab Sample ID: 240-159141-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	1.0	J	2.0	0.86	ug/L	1		8260B SIM	Total/NA
Vinyl chloride	5.6		1.0	0.45	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159141-1

Client Sample ID: TRIP BLANK_02
Date Collected: 11/01/21 00:00
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159141-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 05:11	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 05:11	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 05:11	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 05:11	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 05:11	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 05:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*		*11/11/21 05:11*	*1*
4-Bromofluorobenzene (Surr)	*74*		*56 - 136*		*11/11/21 05:11*	*1*
Toluene-d8 (Surr)	*103*		*78 - 122*		*11/11/21 05:11*	*1*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*11/11/21 05:11*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159141-1

Client Sample ID: MW-108S_110121
Date Collected: 11/01/21 11:15
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159141-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/04/21 23:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*66 - 120*		*11/04/21 23:37*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 05:33	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 05:33	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 05:33	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 05:33	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 05:33	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 05:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/11/21 05:33*	*1*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*		*11/11/21 05:33*	*1*
Toluene-d8 (Surr)	*105*		*78 - 122*		*11/11/21 05:33*	*1*
Dibromofluoromethane (Surr)	*93*		*73 - 120*		*11/11/21 05:33*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159141-1

Client Sample ID: MW-85SR_110121
Date Collected: 11/01/21 13:20
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159141-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/05/21 00:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*66 - 120*		*11/05/21 00:00*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 05:55	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 05:55	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 05:55	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 05:55	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 05:55	1
Vinyl chloride	**0.69**	**J**	1.0	0.45	ug/L			11/11/21 05:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/11/21 05:55*	*1*
4-Bromofluorobenzene (Surr)	*75*		*56 - 136*		*11/11/21 05:55*	*1*
Toluene-d8 (Surr)	*107*		*78 - 122*		*11/11/21 05:55*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*11/11/21 05:55*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159141-1

Client Sample ID: MW-85_110121
Date Collected: 11/01/21 14:40
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159141-4
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/05/21 00:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*66 - 120*		*11/05/21 00:24*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 06:18	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 06:18	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 06:18	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 06:18	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 06:18	1
Vinyl chloride	**4.8**		1.0	0.45	ug/L			11/11/21 06:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*62 - 137*		*11/11/21 06:18*	*1*
4-Bromofluorobenzene (Surr)	*74*		*56 - 136*		*11/11/21 06:18*	*1*
Toluene-d8 (Surr)	*96*		*78 - 122*		*11/11/21 06:18*	*1*
Dibromofluoromethane (Surr)	*88*		*73 - 120*		*11/11/21 06:18*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159141-1

Client Sample ID: DUP-06
Date Collected: 11/01/21 00:00
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159141-5
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**1.0**	**J**	2.0	0.86	ug/L			11/05/21 00:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*66 - 120*		*11/05/21 00:48*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 06:40	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 06:40	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 06:40	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 06:40	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 06:40	1
Vinyl chloride	**5.6**		1.0	0.45	ug/L			11/11/21 06:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*		*11/11/21 06:40*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/11/21 06:40*	*1*
Toluene-d8 (Surr)	*107*		*78 - 122*		*11/11/21 06:40*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/11/21 06:40*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159141-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159141-1	TRIP BLANK_02	90	74	103	91
240-159141-2	MW-108S_110121	93	84	105	93
240-159141-3	MW-85SR_110121	93	75	107	92
240-159141-4	MW-85_110121	87	74	96	88
240-159141-5	DUP-06	98	81	107	98
240-159143-E-3 MSD	Matrix Spike Duplicate	94	97	117	95
240-159143-H-3 MS	Matrix Spike	90	88	108	92
LCS 240-512327/4	Lab Control Sample	88	84	107	90
MB 240-512327/6	Method Blank	92	78	103	91

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159141-2	MW-108S_110121	92
240-159141-3	MW-85SR_110121	91
240-159141-4	MW-85_110121	93
240-159141-5	DUP-06	95
240-159143-G-3 MS	Matrix Spike	91
240-159143-M-3 MSD	Matrix Spike Duplicate	89
LCS 240-511462/4	Lab Control Sample	89
MB 240-511462/5	Method Blank	93

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512327/6
Matrix: Water
Analysis Batch: 512327

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/10/21 23:58	1
cis-1,2-Dichloroethene	0.541	J	1.0	0.46	ug/L			11/10/21 23:58	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/10/21 23:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/10/21 23:58	1
Trichloroethene	0.468	J	1.0	0.44	ug/L			11/10/21 23:58	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/10/21 23:58	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/10/21 23:58*	*1*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*		*11/10/21 23:58*	*1*
Toluene-d8 (Surr)	*103*		*78 - 122*		*11/10/21 23:58*	*1*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*11/10/21 23:58*	*1*

Lab Sample ID: LCS 240-512327/4
Matrix: Water
Analysis Batch: 512327

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.4		ug/L		104	63 - 134
cis-1,2-Dichloroethene	10.0	10.7		ug/L		107	77 - 123
Tetrachloroethene	10.0	10.6		ug/L		106	76 - 123
trans-1,2-Dichloroethene	10.0	10.0		ug/L		100	75 - 124
Trichloroethene	10.0	9.37		ug/L		94	70 - 122
Vinyl chloride	10.0	8.92		ug/L		89	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*62 - 137*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*
Toluene-d8 (Surr)	*107*		*78 - 122*
Dibromofluoromethane (Surr)	*90*		*73 - 120*

Lab Sample ID: 240-159143-E-3 MSD
Matrix: Water
Analysis Batch: 512327

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.21		ug/L		92	56 - 135	1	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.70		ug/L		97	66 - 128	4	14
Tetrachloroethene	1.0	U	10.0	8.77		ug/L		88	62 - 131	10	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.34		ug/L		93	56 - 136	4	15
Trichloroethene	1.0	U	10.0	7.92		ug/L		79	61 - 124	6	15
Vinyl chloride	1.0	U	10.0	10.1		ug/L		101	43 - 157	6	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*94*		*62 - 137*
4-Bromofluorobenzene (Surr)	*97*		*56 - 136*
Toluene-d8 (Surr)	*117*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159143-E-3 MSD
Matrix: Water
Analysis Batch: 512327

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
Dibromofluoromethane (Surr)	*95*		*73 - 120*

Lab Sample ID: 240-159143-H-3 MS
Matrix: Water
Analysis Batch: 512327

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.32		ug/L		93	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.36		ug/L		94	66 - 128
Tetrachloroethene	1.0	U	10.0	7.97		ug/L		80	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	8.94		ug/L		89	56 - 136
Trichloroethene	1.0	U	10.0	7.46		ug/L		75	61 - 124
Vinyl chloride	1.0	U	10.0	9.56		ug/L		96	43 - 157

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*88*		*56 - 136*
Toluene-d8 (Surr)	*108*		*78 - 122*
Dibromofluoromethane (Surr)	*92*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-511462/5
Matrix: Water
Analysis Batch: 511462

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/04/21 15:32	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*93*		*66 - 120*		*11/04/21 15:32*	*1*

Lab Sample ID: LCS 240-511462/4
Matrix: Water
Analysis Batch: 511462

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.58		ug/L		96	80 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*89*		*66 - 120*

Lab Sample ID: 240-159143-G-3 MS
Matrix: Water
Analysis Batch: 511462

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	9.25		ug/L		92	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*91*		*66 - 120*

Lab Sample ID: 240-159143-M-3 MSD
Matrix: Water
Analysis Batch: 511462

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.63		ug/L		96	51 - 153	4	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*89*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159141-1

GC/MS VOA

Analysis Batch: 511462

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159141-2	MW-108S_110121	Total/NA	Water	8260B SIM	
240-159141-3	MW-85SR_110121	Total/NA	Water	8260B SIM	
240-159141-4	MW-85_110121	Total/NA	Water	8260B SIM	
240-159141-5	DUP-06	Total/NA	Water	8260B SIM	
MB 240-511462/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-511462/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159143-G-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159143-M-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 512327

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159141-1	TRIP BLANK_02	Total/NA	Water	8260B	
240-159141-2	MW-108S_110121	Total/NA	Water	8260B	
240-159141-3	MW-85SR_110121	Total/NA	Water	8260B	
240-159141-4	MW-85_110121	Total/NA	Water	8260B	
240-159141-5	DUP-06	Total/NA	Water	8260B	
MB 240-512327/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512327/4	Lab Control Sample	Total/NA	Water	8260B	
240-159143-E-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	
240-159143-H-3 MS	Matrix Spike	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159141-1

Client Sample ID: TRIP BLANK_02
Lab Sample ID: 240-159141-1
Date Collected: 11/01/21 00:00
Matrix: Water
Date Received: 11/03/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512327	11/11/21 05:11	LEE	TAL CAN

Client Sample ID: MW-108S_110121
Lab Sample ID: 240-159141-2
Date Collected: 11/01/21 11:15
Matrix: Water
Date Received: 11/03/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512327	11/11/21 05:33	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	511462	11/04/21 23:37	CS	TAL CAN

Client Sample ID: MW-85SR_110121
Lab Sample ID: 240-159141-3
Date Collected: 11/01/21 13:20
Matrix: Water
Date Received: 11/03/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512327	11/11/21 05:55	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	511462	11/05/21 00:00	CS	TAL CAN

Client Sample ID: MW-85_110121
Lab Sample ID: 240-159141-4
Date Collected: 11/01/21 14:40
Matrix: Water
Date Received: 11/03/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512327	11/11/21 06:18	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	511462	11/05/21 00:24	CS	TAL CAN

Client Sample ID: DUP-06
Lab Sample ID: 240-159141-5
Date Collected: 11/01/21 00:00
Matrix: Water
Date Received: 11/03/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512327	11/11/21 06:40	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	511462	11/05/21 00:48	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159141-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN

Chain of Custody Record

Q1/02

TestAmerica

TestAmerica Laboratory location Brighton 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: CHRISTINA WEAVER SOMMER GUY, SAM HINDLE	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford I TP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_Q2	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-108S_110121	11/1/21	1115		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-85SR_110121		1320		6						6					N	G	X	X	X	X	X	X	X	
MW 85_ 110121		1440		6						6					N	G	X	X	X	X	X	X	X	
DUP-Q6		—		6						6					N	G	X	X	X	X	X	X	X	

240-159141 Chain of Custody

Possible Hazard Identification
Non-Hazard Flammable Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Return to Client Disposal By Lab Archive for Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomal a@cadenaco.com Cadena #E20363
Level IV Reporting requested

	Company	Date/Time		Company	Date/Time
Relinquished by:	ARCADIS	11/01/21 1700	Received by: NOVI COLD STORAGE	ARCADIS	11/01/21 1700
Relinquished by:	Arcadis	11/2/21 1250	Received by:	GA	11/2/21 1400
Relinquished by:	GA	11/2/21 1251	Received in Laboratory by:	CTR	11/3/21 8 0AM

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11/17/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159141**
Canton Facility

Client ARCADIS Site Name

Cooler Received on 11/3/21 Opened on 11/3/21

Cooler unpacked by: Matthew Surma

FedEx 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used. (Bubble Wrap) Foam Plastic Bag None Other

COOLANT (Wet Ice) Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR 14 (CF +0.1 °C) Observed Cooler Temp 0.1 °C Corrected Cooler Temp. 0.2 °C

IR GUN #IR 15 (CF +0.2°C) Observed Cooler Temp ____ °C Corrected Cooler Temp ____ °C

2	Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes) No
	Were the seals on the outside of the cooler(s) signed & dated?	(Yes) No NA
	Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes (No)
	Were tamper/custody seals intact and uncompromised?	(Yes) No NA
3	Shippers' packing slip attached to the cooler(s)?	Yes (No)
4	Did custody papers accompany the sample(s)?	(Yes) No
5	Were the custody papers relinquished & signed in the appropriate place?	(Yes) No
6	Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes) No
7	Did all bottles arrive in good condition (Unbroken)?	(Yes) No
8	Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes) No
9	For each sample, does the COC specify preservatives (Y/N) # of containers (Y/N), and sample type of grab/comp(Y/N)?	
10	Were correct bottle(s) used for the test(s) indicated?	(Yes) No
11	Sufficient quantity received to perform indicated analyses?	(Yes) No
12	Are these work share samples and all listed on the COC?	Yes (No)
	If yes, Questions 13-17 have been checked at the originating laboratory	
13	Were all preserved sample(s) at the correct pH upon receipt?	Yes No (NA) pH Strip Lot# HC157842
14	Were VOAs on the COC?	(Yes) No
15	Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes (No) NA
16	Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 010420 16	(Yes) No
17	Was a LL Hg or Me Hg trip blank present? ____	Yes (No)

Tests that are not checked for pH by Receiving.

VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

trip blank does not receive 8260D SIM

19 SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.

Sample(s) ____ were received in a broken container

Sample(s) ____ were received with bubble >6 mm in diameter (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory

Time preserved. ____ Preservative(s) added/Lot number(s) ____

VOA Sample Preservation Date/Time VOAs Frozen ____

DATA VERIFICATION REPORT

November 17, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159141-1
Sample date: 2021-11-01
Report received by CADENA: 2021-11-17
Initial Data Verification completed by CADENA: 2021-11-17
Number of Samples:5
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 512327 method blank had detections below the RL for the following analytes: CIS-1,2-DICHLOROETHENE and TRICHLOROETHENE. Qualification of client sample results was not required based on these method blank detections.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159141-1

	Sample Name:	TRIP BLANK_02				MW-108S_110121				MW-85SR_110121				MW-85_110121				DUP-06			
	Lab Sample ID:	2401591411				2401591412				2401591413				2401591414				2401591415			
	Sample Date:	11/1/2021				11/1/2021				11/1/2021				11/1/2021				11/1/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC																					
OSW-8260B																					
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	0.69	1.0	ug/l	J	4.8	1.0	ug/l	---	5.6	1.0	ug/l	---
OSW-8260BBSim																					
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---	ND	2.0	ug/l	---	1.0	2.0	ug/l	J

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

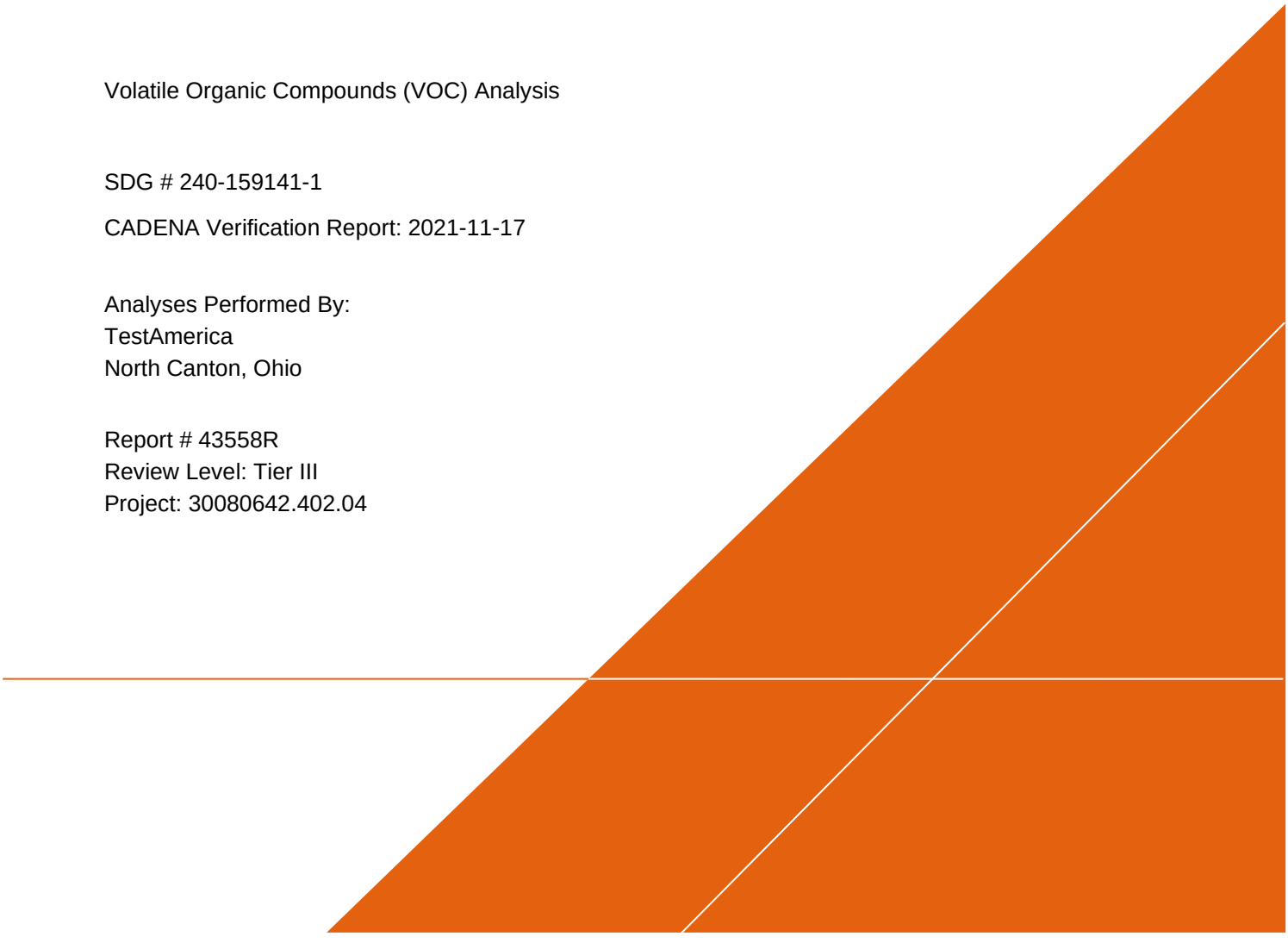
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159141-1

CADENA Verification Report: 2021-11-17

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43558R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159141-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_02	240-159141-1	Water	11/01/2021		X	
MW-108S_110121	240-159141-2	Water	11/01/2021		X	X
MW-85SR_110121	240-159141-3	Water	11/01/2021		X	X
MW-85_110121	240-159141-4	Water	11/01/2021		X	X
DUP-06	240-159141-5	Water	11/01/2021	MW-85_110121	X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

DATA REVIEW

Sample ID/Duplicate ID	Compounds	Sample Result (µg/L)	Duplicate Result (µg/L)	RPD
MW-85_110121 / DUP-06	Vinyl chloride	4.8	5.6	AC
	1,4-Dioxane	2.0 U	1.0 J	AC

Notes:

AC – Acceptable

The calculated differences between the parent sample and field duplicate were acceptable.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE:

DATE: December 02, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 2, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN

Chain of Custody Record

Q1/02

TestAmerica

TestAmerica Laboratory location Brighton 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: CHRISTINA WEAVER SOMMER GUY, SAM HINDLE	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford I TP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_Q2	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-108S_110121	11/1/21	1115		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-85SR_110121		1320		6						6					N	G	X	X	X	X	X	X	X	
MW 85_ 110121		1440		6						6					N	G	X	X	X	X	X	X	X	
DUP-Q6		—		6						6					N	G	X	X	X	X	X	X	X	

240-159141 Chain of Custody

Possible Hazard Identification
Non-Hazard Flammable Irritant Poison B Unknown

Sample Disposal (A fee may be assesse
Return to Client Disposal ve for Months

Special Instructions/QC Requirements & Comments:

Submit al results through Cade a at jtomal a@cadenaco.com Cadena #E20363
Level IV Reporting requested

	Company	Date/Time		Company	Date/Time
Relinquished by	ARCADIS	11/01/21	1700	NOVI COLD STORAGE	ARCADIS 11/01/21 1700
Relinquished by	Arcadis	11/2/21	1250		GP 11/2/21 1400
Relinquished by	GP	11/3/21	1251	Received in Laboratory by	CTR 11/3/21 8 0AM

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11/17/2021

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159141-1

Client Sample ID: TRIP BLANK_02
Date Collected: 11/01/21 00:00
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159141-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 05:11	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 05:11	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 05:11	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 05:11	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 05:11	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 05:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*		*11/11/21 05:11*	*1*
4-Bromofluorobenzene (Surr)	*74*		*56 - 136*		*11/11/21 05:11*	*1*
Toluene-d8 (Surr)	*103*		*78 - 122*		*11/11/21 05:11*	*1*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*11/11/21 05:11*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159141-1

Client Sample ID: MW-108S_110121
Date Collected: 11/01/21 11:15
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159141-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/04/21 23:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*66 - 120*		*11/04/21 23:37*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 05:33	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 05:33	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 05:33	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 05:33	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 05:33	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 05:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/11/21 05:33*	*1*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*		*11/11/21 05:33*	*1*
Toluene-d8 (Surr)	*105*		*78 - 122*		*11/11/21 05:33*	*1*
Dibromofluoromethane (Surr)	*93*		*73 - 120*		*11/11/21 05:33*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159141-1

Client Sample ID: MW-85SR_110121
Date Collected: 11/01/21 13:20
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159141-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/05/21 00:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*66 - 120*		*11/05/21 00:00*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 05:55	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 05:55	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 05:55	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 05:55	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 05:55	1
Vinyl chloride	**0.69**	**J**	1.0	0.45	ug/L			11/11/21 05:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/11/21 05:55*	*1*
4-Bromofluorobenzene (Surr)	*75*		*56 - 136*		*11/11/21 05:55*	*1*
Toluene-d8 (Surr)	*107*		*78 - 122*		*11/11/21 05:55*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*11/11/21 05:55*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159141-1

Client Sample ID: MW-85_110121
Date Collected: 11/01/21 14:40
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159141-4
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/05/21 00:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*66 - 120*		*11/05/21 00:24*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 06:18	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 06:18	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 06:18	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 06:18	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 06:18	1
Vinyl chloride	**4.8**		1.0	0.45	ug/L			11/11/21 06:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*62 - 137*		*11/11/21 06:18*	*1*
4-Bromofluorobenzene (Surr)	*74*		*56 - 136*		*11/11/21 06:18*	*1*
Toluene-d8 (Surr)	*96*		*78 - 122*		*11/11/21 06:18*	*1*
Dibromofluoromethane (Surr)	*88*		*73 - 120*		*11/11/21 06:18*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159141-1

Client Sample ID: DUP-06
Date Collected: 11/01/21 00:00
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159141-5
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**1.0**	**J**	2.0	0.86	ug/L			11/05/21 00:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*66 - 120*		*11/05/21 00:48*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 06:40	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 06:40	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 06:40	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 06:40	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 06:40	1
Vinyl chloride	**5.6**		1.0	0.45	ug/L			11/11/21 06:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*		*11/11/21 06:40*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/11/21 06:40*	*1*
Toluene-d8 (Surr)	*107*		*78 - 122*		*11/11/21 06:40*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/11/21 06:40*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159143-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/17/2021 10:52:26 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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Have a Question? Ask The Expert

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159143-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159143-1

Job ID: 240-159143-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159143-1

Comments
No additional comments.

Receipt
The samples were received on 11/3/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.2º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159143-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159143-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159143-1	TRIP BLANK_11	Water	11/01/21 00:00	11/03/21 08:00
240-159143-2	MW-87S_110121	Water	11/01/21 10:46	11/03/21 08:00
240-159143-3	MW-87_110121	Water	11/01/21 11:46	11/03/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159143-1

Client Sample ID: TRIP BLANK_11 — Lab Sample ID: 240-159143-1

No Detections.

Client Sample ID: MW-87S_110121 — Lab Sample ID: 240-159143-2

No Detections.

Client Sample ID: MW-87_110121 — Lab Sample ID: 240-159143-3

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159143-1

Client Sample ID: TRIP BLANK_11

Date Collected: 11/01/21 00:00
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159143-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 07:03	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 07:03	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 07:03	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 07:03	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 07:03	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 07:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/11/21 07:03*	*1*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*		*11/11/21 07:03*	*1*
Toluene-d8 (Surr)	*106*		*78 - 122*		*11/11/21 07:03*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/11/21 07:03*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159143-1

Client Sample ID: MW-87S_110121
Date Collected: 11/01/21 10:46
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159143-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/05/21 01:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*66 - 120*		*11/05/21 01:12*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 07:25	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 07:25	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 07:25	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 07:25	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 07:25	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 07:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/11/21 07:25*	*1*
4-Bromofluorobenzene (Surr)	*77*		*56 - 136*		*11/11/21 07:25*	*1*
Toluene-d8 (Surr)	*103*		*78 - 122*		*11/11/21 07:25*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*11/11/21 07:25*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159143-1

Client Sample ID: MW-87_110121
Date Collected: 11/01/21 11:46
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159143-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/04/21 19:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*66 - 120*		*11/04/21 19:13*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 07:47	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 07:47	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 07:47	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 07:47	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 07:47	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 07:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*62 - 137*		*11/11/21 07:47*	*1*
4-Bromofluorobenzene (Surr)	*75*		*56 - 136*		*11/11/21 07:47*	*1*
Toluene-d8 (Surr)	*106*		*78 - 122*		*11/11/21 07:47*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/11/21 07:47*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159143-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159143-1	TRIP BLANK_11	93	78	106	94
240-159143-2	MW-87S_110121	93	77	103	92
240-159143-3	MW-87_110121	91	75	106	94
240-159143-3 MS	MW-87-MS_110121	90	88	108	92
240-159143-3 MSD	MW-87-MSD_110121	94	97	117	95
LCS 240-512327/4	Lab Control Sample	88	84	107	90
MB 240-512327/6	Method Blank	92	78	103	91

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159143-2	MW-87S_110121	91
240-159143-3	MW-87_110121	96
240-159143-3 MS	MW-87-MS_110121	91
240-159143-3 MSD	MW-87-MSD_110121	89
LCS 240-511462/4	Lab Control Sample	89
MB 240-511462/5	Method Blank	93

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512327/6
Matrix: Water
Analysis Batch: 512327

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/10/21 23:58	1
cis-1,2-Dichloroethene	0.541	J	1.0	0.46	ug/L			11/10/21 23:58	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/10/21 23:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/10/21 23:58	1
Trichloroethene	0.468	J	1.0	0.44	ug/L			11/10/21 23:58	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/10/21 23:58	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/10/21 23:58*	*1*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*		*11/10/21 23:58*	*1*
Toluene-d8 (Surr)	*103*		*78 - 122*		*11/10/21 23:58*	*1*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*11/10/21 23:58*	*1*

Lab Sample ID: LCS 240-512327/4
Matrix: Water
Analysis Batch: 512327

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.4		ug/L		104	63 - 134
cis-1,2-Dichloroethene	10.0	10.7		ug/L		107	77 - 123
Tetrachloroethene	10.0	10.6		ug/L		106	76 - 123
trans-1,2-Dichloroethene	10.0	10.0		ug/L		100	75 - 124
Trichloroethene	10.0	9.37		ug/L		94	70 - 122
Vinyl chloride	10.0	8.92		ug/L		89	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*62 - 137*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*
Toluene-d8 (Surr)	*107*		*78 - 122*
Dibromofluoromethane (Surr)	*90*		*73 - 120*

Lab Sample ID: 240-159143-3 MS
Matrix: Water
Analysis Batch: 512327

Client Sample ID: MW-87-MS_110121
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.32		ug/L		93	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.36		ug/L		94	66 - 128
Tetrachloroethene	1.0	U	10.0	7.97		ug/L		80	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	8.94		ug/L		89	56 - 136
Trichloroethene	1.0	U	10.0	7.46		ug/L		75	61 - 124
Vinyl chloride	1.0	U	10.0	9.56		ug/L		96	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*88*		*56 - 136*
Toluene-d8 (Surr)	*108*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159143-3 MS
Matrix: Water
Analysis Batch: 512327

Client Sample ID: MW-87-MS_110121
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	92		73 - 120

Lab Sample ID: 240-159143-3 MSD
Matrix: Water
Analysis Batch: 512327

Client Sample ID: MW-87-MSD_110121
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.21		ug/L		92	56 - 135	1	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.70		ug/L		97	66 - 128	4	14
Tetrachloroethene	1.0	U	10.0	8.77		ug/L		88	62 - 131	10	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.34		ug/L		93	56 - 136	4	15
Trichloroethene	1.0	U	10.0	7.92		ug/L		79	61 - 124	6	15
Vinyl chloride	1.0	U	10.0	10.1		ug/L		101	43 - 157	6	24

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	94		62 - 137
4-Bromofluorobenzene (Surr)	97		56 - 136
Toluene-d8 (Surr)	117		78 - 122
Dibromofluoromethane (Surr)	95		73 - 120

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-511462/5
Matrix: Water
Analysis Batch: 511462

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/04/21 15:32	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	93		66 - 120		11/04/21 15:32	1

Lab Sample ID: LCS 240-511462/4
Matrix: Water
Analysis Batch: 511462

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.58		ug/L		96	80 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	89		66 - 120

Lab Sample ID: 240-159143-3 MS
Matrix: Water
Analysis Batch: 511462

Client Sample ID: MW-87-MS_110121
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	9.25		ug/L		92	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*91*		*66 - 120*

Lab Sample ID: 240-159143-3 MSD
Matrix: Water
Analysis Batch: 511462

Client Sample ID: MW-87-MSD_110121
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.63		ug/L		96	51 - 153	4	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*89*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159143-1

GC/MS VOA

Analysis Batch: 511462

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159143-2	MW-87S_110121	Total/NA	Water	8260B SIM	
240-159143-3	MW-87_110121	Total/NA	Water	8260B SIM	
MB 240-511462/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-511462/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159143-3 MS	MW-87-MS_110121	Total/NA	Water	8260B SIM	
240-159143-3 MSD	MW-87-MSD_110121	Total/NA	Water	8260B SIM	

Analysis Batch: 512327

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159143-1	TRIP BLANK_11	Total/NA	Water	8260B	
240-159143-2	MW-87S_110121	Total/NA	Water	8260B	
240-159143-3	MW-87_110121	Total/NA	Water	8260B	
MB 240-512327/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512327/4	Lab Control Sample	Total/NA	Water	8260B	
240-159143-3 MS	MW-87-MS_110121	Total/NA	Water	8260B	
240-159143-3 MSD	MW-87-MSD_110121	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159143-1

Client Sample ID: TRIP BLANK_11

Lab Sample ID: 240-159143-1

Date Collected: 11/01/21 00:00

Matrix: Water

Date Received: 11/03/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512327	11/11/21 07:03	LEE	TAL CAN

Client Sample ID: MW-87S_110121

Lab Sample ID: 240-159143-2

Date Collected: 11/01/21 10:46

Matrix: Water

Date Received: 11/03/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512327	11/11/21 07:25	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	511462	11/05/21 01:12	CS	TAL CAN

Client Sample ID: MW-87_110121

Lab Sample ID: 240-159143-3

Date Collected: 11/01/21 11:46

Matrix: Water

Date Received: 11/03/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512327	11/11/21 07:47	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	511462	11/04/21 19:13	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159143-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN
190

Chain of Custody Record

01/02

TestAmerica

TestAmerica Laboratory location Brighton 10448 Citation Drive Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COC
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Allyson Hartz	TAT if different from below: 10 day; 3 weeks, 2 weeks (✓), 1 week, 2 days, 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac/ NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 11	--	--		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW 67S_110121	11/1/21	10 46		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-67_110121	↓	11 46		X						6					N	G	X	X	X	X	X	X	X	
MW 67-MS_110121		11 46		X						6					N	G	X	X	X	X	X	X	X	run MS/MSD
MW 67 MSD_110121	↓	11 46		X						6					N	G	X	X	X	X	X	X	X	run MS/MSD

240-159143 Chain of Custody

Possible Hazard Identification
✓ Non-Hazard Flammable In Irritant Poison B Unknown

Sample Disposal (A fee may be asses
Return to Client ✓ Dispo

Special Instructions/QC Requirements & Comments:

Submit a results th igh Cadena at jtom ia@cade aco com Cadena #E20363
Level Reporting requested

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Allyson Hartz	Arcadis	11/1/21 1700	Navigard storage	Arcadis	11/1/21 1700
Relinquished by: Julia McClafferty	Company: Arcadis	Date/Time: 11/2/21 1250	Received by:	Company: GTA	Date/Time: 11/2/21 1250
Relinquished by:	Company: GTA	Date/Time: 11/2/21 1211	Received in Laboratory by	Company: FTA	Date/Time: 11/3/21 8:00 am

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11/17/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 159143

Client ARCADIS Site Name _____

Cooler Received on 11/3/21 Opened on 11/3/21

Cooler unpacked by: Matthew Sma

FedEx. 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours. Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used. Bubble Wrap Foam Plastic Bag None Other _____

COOLANT Wet Ice Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.1 °C Corrected Cooler Temp 0.2 °C

IR GUN #IR 15 (CF +0.2°C) Observed Cooler Temp _____ °C Corrected Cooler Temp _____ °C

2	Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
	Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
	-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
	-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3	Shippers' packing slip attached to the cooler(s)?	Yes	No
4	Did custody papers accompany the sample(s)?	Yes	No
5	Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6	Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No BB
7	Did all bottles arrive in good condition (Unbroken)?	Yes	No
8	Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9	For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10	Were correct bottle(s) used for the test(s) indicated?	Yes	No
11	Sufficient quantity received to perform indicated analyses?	Yes	No BB
12	Are these work share samples and all listed on the COC?	Yes	No
	If yes, Questions 13-17 have been checked at the originating laboratory		
13	Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC157842
14	Were VOAs on the COC?	Yes	No
15	Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16	Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 010-42016	Yes	No
17	Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

trip blank does not receive 8260 SIM - BB

19 SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired

Sample(s) _____ were received in a broken container

Sample(s) _____ were received with bubble >6 mm in diameter (Notify PM)

20 SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory

Time preserved _____ Preservative(s) added/Lot number(s) _____

VOA Sample Preservation Date/Time VOAs Frozen _____

DATA VERIFICATION REPORT

November 17, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159143-1
Sample date: 2021-11-01
Report received by CADENA: 2021-11-17
Initial Data Verification completed by CADENA: 2021-11-17
Number of Samples:3
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 512327 method blank had detections below the RL for the following analytes: CIS-1,2-DICHLOROETHENE and TRICHLOROETHENE. Qualification of client sample results was not required based on these method blank detections.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, MS/MSD Recovery, MS/MSD RPD, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159143-1

		Sample Name:	TRIP BLANK_11				MW-87S_110121				MW-87_110121			
		Lab Sample ID:	2401591431				2401591432				2401591433			
		Sample Date:	11/1/2021				11/1/2021				11/1/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC													
OSW-8260B													
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim													
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

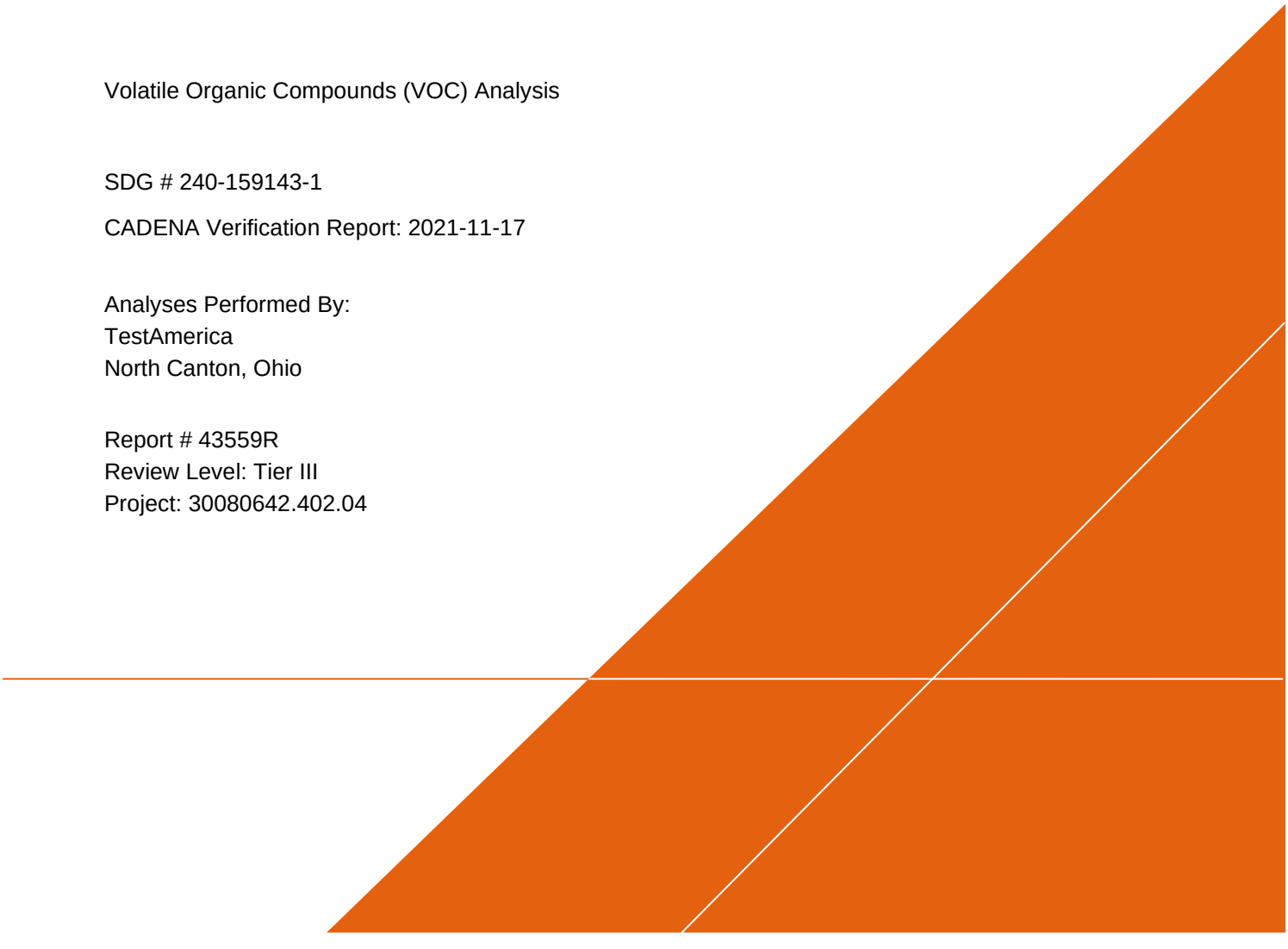
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159143-1

CADENA Verification Report: 2021-11-17

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43559R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159143-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_11	240-159143-1	Water	11/01/2021		X	
MW-87S_110121	240-159143-2	Water	11/01/2021		X	X
MW-87_110121	240-159143-3	Water	11/01/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE:

DATE: December 02, 2021

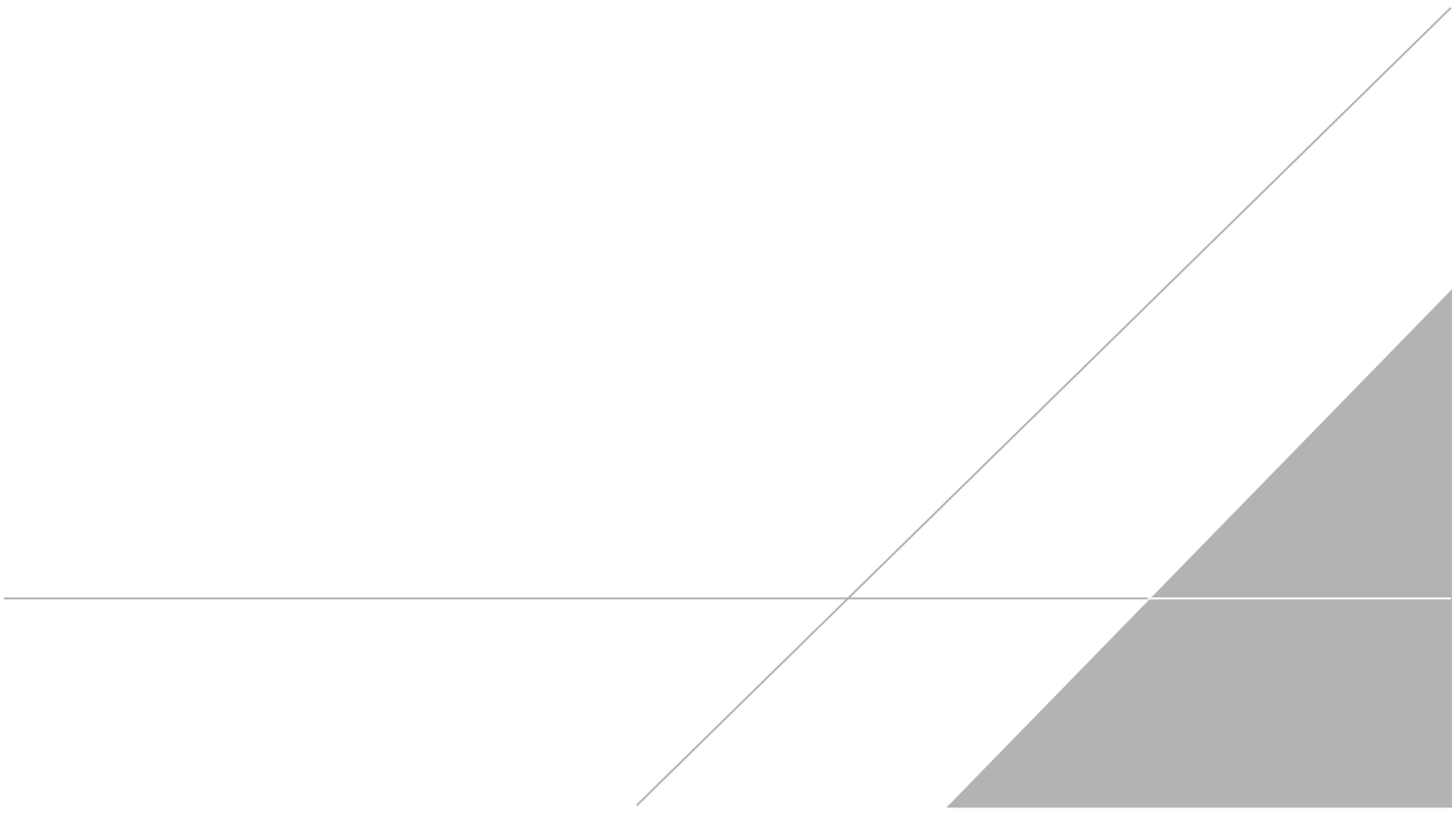
PEER REVIEW: Andrew Korycinski

DATE: December 2, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



MICHIGAN
190

Chain of Custody Record

01/02

TestAmerica

TestAmerica Laboratory location Brighton 10448 Citation Drive Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COC
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Allyson Hartz	TAT if different from below: 10 day; 3 weeks, 2 weeks (✓), 1 week, 2 days, 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac/ NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 11	--	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW 67S_110121	11/1/21	10 46		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-67_110121	↓	11 46		X						6					N	G	X	X	X	X	X	X	X	
MW 67-MS_110121		11 46		X						6					N	G	X	X	X	X	X	X	X	run MS/MSD
MW 67 MSD_110121		11 46		X						6					N	G	X	X	X	X	X	X	X	run MS/MSD

240-159143 Chain of Custody

Possible Hazard Identification
✓ Non-Hazard Flammable In Irritant Poison B Unknown

Sample Disposal (A fee may be asses
Return to Client ✓ Dispo

Special Instructions/QC Requirements & Comments:

Submit a results th igh Cadena at jtom ia@cade aco com Cadena #E20363
Level Reporting requested

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Allyson Hartz	Arcadis	11/1/21 1700	Navigard storage	Arcadis	11/1/21 1700
Relinquished by: Julia McClafferty	Company: Arcadis	Date/Time: 11/2/21 1250	Received by:	Company: GTA	Date/Time: 11/2/21 1250
Relinquished by:	Company: GTA	Date/Time: 11/2/21 1211	Received in Laboratory by	Company: FTA	Date/Time: 11/3/21 8:00 am

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11/17/2021

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159143-1

Client Sample ID: TRIP BLANK_11

Date Collected: 11/01/21 00:00
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159143-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 07:03	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 07:03	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 07:03	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 07:03	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 07:03	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 07:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/11/21 07:03*	*1*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*		*11/11/21 07:03*	*1*
Toluene-d8 (Surr)	*106*		*78 - 122*		*11/11/21 07:03*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/11/21 07:03*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159143-1

Client Sample ID: MW-87S_110121
Date Collected: 11/01/21 10:46
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159143-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/05/21 01:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*66 - 120*		*11/05/21 01:12*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 07:25	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 07:25	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 07:25	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 07:25	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 07:25	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 07:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/11/21 07:25*	*1*
4-Bromofluorobenzene (Surr)	*77*		*56 - 136*		*11/11/21 07:25*	*1*
Toluene-d8 (Surr)	*103*		*78 - 122*		*11/11/21 07:25*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*11/11/21 07:25*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159143-1

Client Sample ID: MW-87_110121
Date Collected: 11/01/21 11:46
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159143-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/04/21 19:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*66 - 120*		*11/04/21 19:13*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 07:47	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 07:47	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 07:47	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 07:47	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 07:47	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 07:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*62 - 137*		*11/11/21 07:47*	*1*
4-Bromofluorobenzene (Surr)	*75*		*56 - 136*		*11/11/21 07:47*	*1*
Toluene-d8 (Surr)	*106*		*78 - 122*		*11/11/21 07:47*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/11/21 07:47*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159310-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/18/2021 3:19:56 PM

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Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159310-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159310-1

Job ID: 240-159310-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159310-1

Comments
No additional comments.

Receipt
The samples were received on 11/4/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.0º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159310-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159310-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159310-1	TRIP BLANK_24	Water	11/01/21 00:00	11/04/21 08:00
240-159310-2	MW-96S_110121	Water	11/01/21 15:32	11/04/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159310-1

Client Sample ID: TRIP BLANK_24 — Lab Sample ID: 240-159310-1

No Detections.

Client Sample ID: MW-96S_110121 — Lab Sample ID: 240-159310-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159310-1

Client Sample ID: TRIP BLANK_24
Date Collected: 11/01/21 00:00
Date Received: 11/04/21 08:00

Lab Sample ID: 240-159310-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 17:08	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 17:08	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 17:08	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 17:08	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 17:08	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 17:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*123*		*62 - 137*		*11/11/21 17:08*	*1*
4-Bromofluorobenzene (Surr)	*68*		*56 - 136*		*11/11/21 17:08*	*1*
Toluene-d8 (Surr)	*88*		*78 - 122*		*11/11/21 17:08*	*1*
Dibromofluoromethane (Surr)	*111*		*73 - 120*		*11/11/21 17:08*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159310-1

Client Sample ID: MW-96S_110121
Date Collected: 11/01/21 15:32
Date Received: 11/04/21 08:00

Lab Sample ID: 240-159310-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U F1	2.0	0.86	ug/L			11/10/21 23:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/10/21 23:45*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 17:29	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 17:29	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 17:29	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 17:29	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 17:29	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 17:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*118*		*62 - 137*		*11/11/21 17:29*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/11/21 17:29*	*1*
Toluene-d8 (Surr)	*84*		*78 - 122*		*11/11/21 17:29*	*1*
Dibromofluoromethane (Surr)	*103*		*73 - 120*		*11/11/21 17:29*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159310-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159310-1	TRIP BLANK_24	123	68	88	111
240-159310-2	MW-96S_110121	118	70	84	103
240-159310-2 MS	MW-96S-MS_110121	103	98	103	94
240-159310-2 MSD	MW-96S-MSD_110121	103	96	102	92
LCS 240-512503/4	Lab Control Sample	102	94	101	93
MB 240-512503/7	Method Blank	114	77	90	98

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159310-2	MW-96S_110121	84
240-159310-2 MS	MW-96S-MS_110121	84
240-159310-2 MSD	MW-96S-MSD_110121	84
LCS 240-512369/6	Lab Control Sample	85
MB 240-512369/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512503/7
Matrix: Water
Analysis Batch: 512503

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 13:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 13:07	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 13:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 13:07	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 13:07	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 13:07	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*114*		*62 - 137*		*11/11/21 13:07*	*1*
4-Bromofluorobenzene (Surr)	*77*		*56 - 136*		*11/11/21 13:07*	*1*
Toluene-d8 (Surr)	*90*		*78 - 122*		*11/11/21 13:07*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/11/21 13:07*	*1*

Lab Sample ID: LCS 240-512503/4
Matrix: Water
Analysis Batch: 512503

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.54		ug/L		85	63 - 134
cis-1,2-Dichloroethene	10.0	10.9		ug/L		109	77 - 123
Tetrachloroethene	10.0	9.61		ug/L		96	76 - 123
trans-1,2-Dichloroethene	10.0	11.3		ug/L		113	75 - 124
Trichloroethene	10.0	9.58		ug/L		96	70 - 122
Vinyl chloride	10.0	8.69		ug/L		87	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*
Toluene-d8 (Surr)	*101*		*78 - 122*
Dibromofluoromethane (Surr)	*93*		*73 - 120*

Lab Sample ID: 240-159310-2 MS
Matrix: Water
Analysis Batch: 512503

Client Sample ID: MW-96S-MS_110121
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	8.69		ug/L		87	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.70		ug/L		97	66 - 128
Tetrachloroethene	1.0	U	10.0	8.74		ug/L		87	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	10.1		ug/L		101	56 - 136
Trichloroethene	1.0	U	10.0	8.43		ug/L		84	61 - 124
Vinyl chloride	1.0	U	10.0	8.11		ug/L		81	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*
4-Bromofluorobenzene (Surr)	*98*		*56 - 136*
Toluene-d8 (Surr)	*103*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159310-2 MS
Matrix: Water
Analysis Batch: 512503

Client Sample ID: MW-96S-MS_110121
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: 240-159310-2 MSD
Matrix: Water
Analysis Batch: 512503

Client Sample ID: MW-96S-MSD_110121
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	8.78		ug/L		88	56 - 135	1	26
cis-1,2-Dichloroethene	1.0	U	10.0	10.0		ug/L		100	66 - 128	3	14
Tetrachloroethene	1.0	U	10.0	8.65		ug/L		86	62 - 131	1	20
trans-1,2-Dichloroethene	1.0	U	10.0	10.2		ug/L		102	56 - 136	1	15
Trichloroethene	1.0	U	10.0	8.58		ug/L		86	61 - 124	2	15
Vinyl chloride	1.0	U	10.0	8.51		ug/L		85	43 - 157	5	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*
4-Bromofluorobenzene (Surr)	*96*		*56 - 136*
Toluene-d8 (Surr)	*102*		*78 - 122*
Dibromofluoromethane (Surr)	*92*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512369/5
Matrix: Water
Analysis Batch: 512369

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/10/21 19:46	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/10/21 19:46*	*1*

Lab Sample ID: LCS 240-512369/6
Matrix: Water
Analysis Batch: 512369

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.53		ug/L		95	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

Lab Sample ID: 240-159310-2 MS
Matrix: Water
Analysis Batch: 512369

Client Sample ID: MW-96S-MS_110121
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	9.69		ug/L		97	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*

Lab Sample ID: 240-159310-2 MSD
Matrix: Water
Analysis Batch: 512369

Client Sample ID: MW-96S-MSD_110121
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.59		ug/L		96	51 - 153	1	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159310-1

GC/MS VOA

Analysis Batch: 512369

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159310-2	MW-96S_110121	Total/NA	Water	8260B SIM	
MB 240-512369/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512369/6	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159310-2 MS	MW-96S-MS_110121	Total/NA	Water	8260B SIM	
240-159310-2 MSD	MW-96S-MSD_110121	Total/NA	Water	8260B SIM	

Analysis Batch: 512503

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159310-1	TRIP BLANK_24	Total/NA	Water	8260B	
240-159310-2	MW-96S_110121	Total/NA	Water	8260B	
MB 240-512503/7	Method Blank	Total/NA	Water	8260B	
LCS 240-512503/4	Lab Control Sample	Total/NA	Water	8260B	
240-159310-2 MS	MW-96S-MS_110121	Total/NA	Water	8260B	
240-159310-2 MSD	MW-96S-MSD_110121	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159310-1

Client Sample ID: TRIP BLANK_24

Lab Sample ID: 240-159310-1

Date Collected: 11/01/21 00:00

Matrix: Water

Date Received: 11/04/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512503	11/11/21 17:08	LEE	TAL CAN

Client Sample ID: MW-96S_110121

Lab Sample ID: 240-159310-2

Date Collected: 11/01/21 15:32

Matrix: Water

Date Received: 11/04/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512503	11/11/21 17:29	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512369	11/10/21 23:45	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159310-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton -- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	☐ DW ☐ NPDES ☐ RCRA ☐ Other	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500		Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377		Sampler Name: Andrew Barth	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day (10 day)		Walk-in client
Phone: 248-994-2240		Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site		Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04					
PO # 30080642.402.04					

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_24	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-965_110121	11/1/21	1532		X						C					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-965-MS_110121	11/1/21	1532		X						C					N	G	X	X	X	X	X	X	X	Run MS/MSD
MW-965-MSD_110121	11/1/21	1532		X						C					N	G	X	X	X	X	X	X	X	Run MS/MSD

240-159310 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com, Cadena #E203631
Level IV Reporting requested

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Andrew Barth	Arcadis	11/1/21 1640	Novi cold storage	Arcadis	11/1/21 1640
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	ARCADIS	11/3/21 0940	Jeri Hale	ETA	11/3/21 946
Relinquished by: Jeri Hale	Company: ETA	Date/Time: 11/3/21 1006	Received in Laboratory by: Mandelyn Black	Company: ETA	Date/Time: 11-4-21 8:00

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11/18/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159310**
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Marolyn Black

Cooler Received on 11-4-21 Opened on 11-4-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: ~~Bubble Wrap~~ Foam Plastic Bag None Other _____

COOLANT: Wet Ice ~~Blue Ice~~ Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF **+0.1** °C) Observed Cooler Temp. 0.9 °C Corrected Cooler Temp. 1.0 °C
   IR GUN #IR-15 (CF **+0.2**°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity_____	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	(Yes)	No
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?	(Y)	(Y)
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# **HC157842**
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #_____	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	(No)

jme 11-4-21

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

The TB is not logged for SIM due to insufficient volume.
jme - 11-4-21

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

November 18, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159310-1
Sample date: 2021-11-01
Report received by CADENA: 2021-11-18
Initial Data Verification completed by CADENA: 2021-11-18
Number of Samples:2
Sample Matrices:Water and trip blank
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, MS/MSD Recovery, MS/MSD RPD, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159310-1

		Sample Name:	TRIP BLANK_24				MW-96S_110121			
		Lab Sample ID:	2401593101				2401593102			
		Sample Date:	11/1/2021				11/1/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

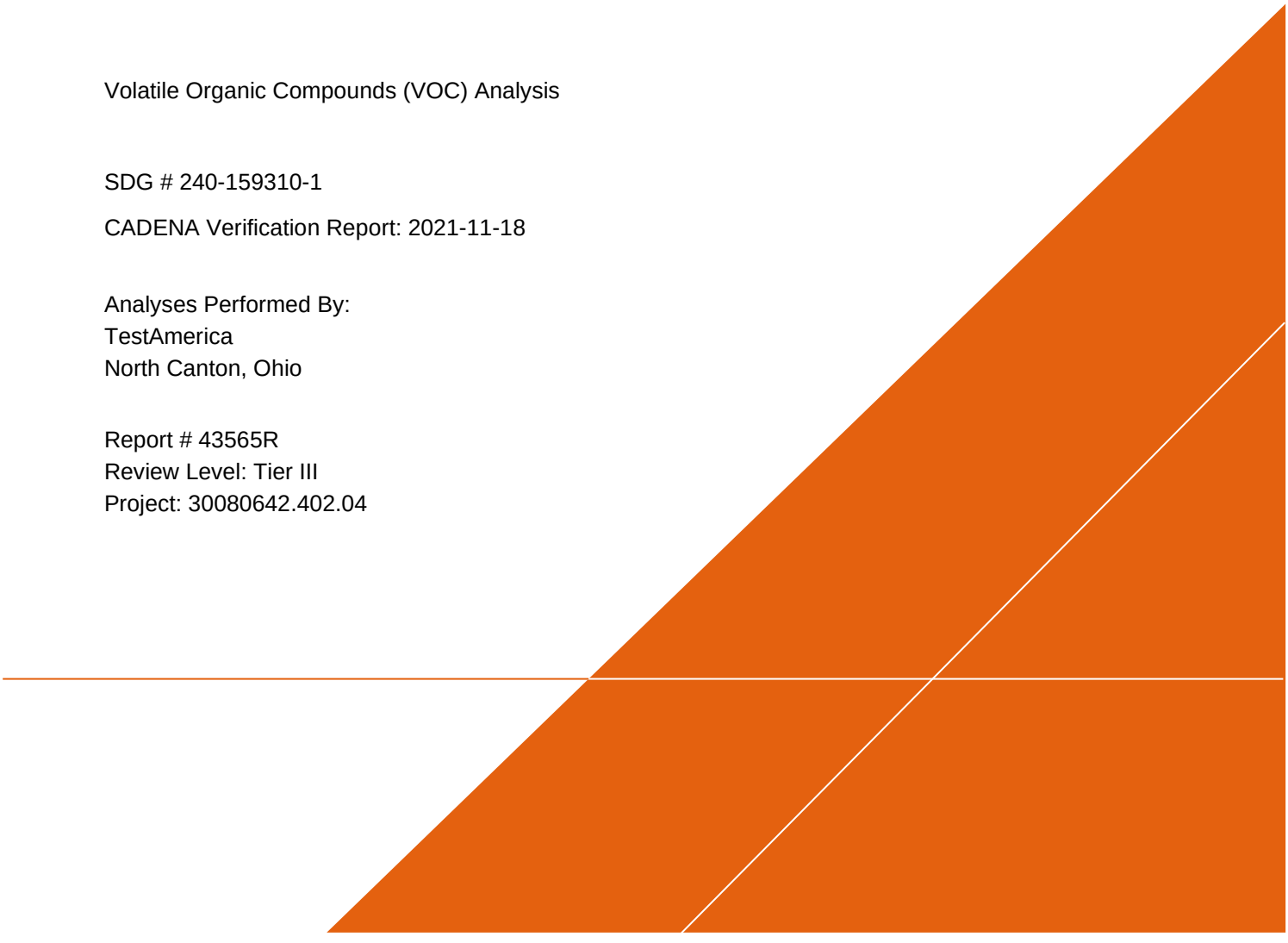
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159310-1

CADENA Verification Report: 2021-11-18

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43565R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159310-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_24	240-159310-1	Water	11/01/2021		X	
MW-96S_110121	240-159310-2	Water	11/01/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Compound	Criteria
TRIP BLANK_24 MW-96S_110121	Continuous Calibration Verification %D	trans-1,2-Dichloroethene	+21.5%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	

Initial/Continuing	Criteria	Sample Result	Qualification
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE:

DATE: December 07, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 7, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton – 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	☐ DW ☐ NPDES ☐ RCRA ☐ Other	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500		Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377		Sampler Name: Andrew Barth	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client:
Phone: 248-994-2240		Method of Shipment/Carrier:	10 day		Lab sampling:
Project Name: Ford LTP Off-Site		Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04					
PO # 30080642.402.04					

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_24	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-965_110121	11/1/21	1532		X						C					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-965-MS_110121	11/1/21	1532		X						C					N	G	X	X	X	X	X	X	X	Run MS/MSD
MW-965-MSD_110121	11/1/21	1532		X						C					N	G	X	X	X	X	X	X	X	Run MS/MSD

240-159310 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com, Cadena #E203631
Level IV Reporting requested

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Andrew Barth	Arcadis	11/1/21 1640	Novi cold storage	Arcadis	11/1/21 1640
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	ARCADIS	11/3/21 0940	Jeri Hale	ETA	11/3/21 946
Relinquished by: Jeri Hale	Company: ETA	Date/Time: 11/3/21 1006	Received in Laboratory by: Mandelyn Black	Company: ETA	Date/Time: 11-4-21 8:00

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11/18/2021

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159310-1

Client Sample ID: TRIP BLANK_24
Date Collected: 11/01/21 00:00
Date Received: 11/04/21 08:00

Lab Sample ID: 240-159310-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 17:08	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 17:08	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 17:08	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 17:08	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 17:08	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 17:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*123*		*62 - 137*		*11/11/21 17:08*	*1*
4-Bromofluorobenzene (Surr)	*68*		*56 - 136*		*11/11/21 17:08*	*1*
Toluene-d8 (Surr)	*88*		*78 - 122*		*11/11/21 17:08*	*1*
Dibromofluoromethane (Surr)	*111*		*73 - 120*		*11/11/21 17:08*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159310-1

Client Sample ID: MW-96S_110121

Date Collected: 11/01/21 15:32
Date Received: 11/04/21 08:00

Lab Sample ID: 240-159310-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U F1	2.0	0.86	ug/L			11/10/21 23:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/10/21 23:45*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 17:29	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 17:29	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 17:29	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 17:29	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 17:29	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 17:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*118*		*62 - 137*		*11/11/21 17:29*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/11/21 17:29*	*1*
Toluene-d8 (Surr)	*84*		*78 - 122*		*11/11/21 17:29*	*1*
Dibromofluoromethane (Surr)	*103*		*73 - 120*		*11/11/21 17:29*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159819-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/26/2021 7:45:20 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159819-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159819-1

Job ID: 240-159819-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159819-1

Comments
No additional comments.

Receipt
The samples were received on 11/11/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 4.6º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159819-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159819-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159819-1	TRIP BLANK_68	Water	11/09/21 00:00	11/11/21 08:00
240-159819-2	MW-97S_110921	Water	11/09/21 09:05	11/11/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159819-1

Client Sample ID: TRIP BLANK_68 — Lab Sample ID: 240-159819-1

No Detections.

Client Sample ID: MW-97S_110921 — Lab Sample ID: 240-159819-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159819-1

Client Sample ID: TRIP BLANK_68

Date Collected: 11/09/21 00:00
Date Received: 11/11/21 08:00

Lab Sample ID: 240-159819-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 03:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 03:50	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 03:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 03:50	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 03:50	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 03:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*121*		*62 - 137*		*11/19/21 03:50*	*1*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*		*11/19/21 03:50*	*1*
Toluene-d8 (Surr)	*115*		*78 - 122*		*11/19/21 03:50*	*1*
Dibromofluoromethane (Surr)	*106*		*73 - 120*		*11/19/21 03:50*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159819-1

Client Sample ID: MW-97S_110921
Date Collected: 11/09/21 09:05
Date Received: 11/11/21 08:00

Lab Sample ID: 240-159819-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 20:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*		*11/12/21 20:36*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 04:12	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 04:12	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 04:12	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 04:12	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 04:12	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 04:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*62 - 137*		*11/19/21 04:12*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/19/21 04:12*	*1*
Toluene-d8 (Surr)	*100*		*78 - 122*		*11/19/21 04:12*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/19/21 04:12*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159819-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159819-1	TRIP BLANK_68	121	84	115	106
240-159819-2	MW-97S_110921	110	81	100	100
240-159830-D-2 MS	Matrix Spike	110	86	101	96
240-159830-E-2 MSD	Matrix Spike Duplicate	107	84	97	94
LCS 240-513667/4	Lab Control Sample	101	85	107	94
MB 240-513667/6	Method Blank	110	81	108	98

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159541-G-2 MS	Matrix Spike	77
240-159541-M-2 MSD	Matrix Spike Duplicate	78
240-159819-2	MW-97S_110921	77
LCS 240-512785/4	Lab Control Sample	79
MB 240-512785/5	Method Blank	79

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513667/6
Matrix: Water
Analysis Batch: 513667

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 23:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 23:24	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 23:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 23:24	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 23:24	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 23:24	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*62 - 137*		*11/18/21 23:24*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/18/21 23:24*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/18/21 23:24*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/18/21 23:24*	*1*

Lab Sample ID: LCS 240-513667/4
Matrix: Water
Analysis Batch: 513667

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.6		ug/L		106	63 - 134
cis-1,2-Dichloroethene	10.0	10.7		ug/L		107	77 - 123
Tetrachloroethene	10.0	12.0		ug/L		120	76 - 123
trans-1,2-Dichloroethene	10.0	10.6		ug/L		106	75 - 124
Trichloroethene	10.0	9.72		ug/L		97	70 - 122
Vinyl chloride	10.0	7.48		ug/L		75	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*101*		*62 - 137*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*
Toluene-d8 (Surr)	*107*		*78 - 122*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: 240-159830-D-2 MS
Matrix: Water
Analysis Batch: 513667

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	8.06		ug/L		81	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.32		ug/L		93	66 - 128
Tetrachloroethene	1.0	U	10.0	9.01		ug/L		90	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.50		ug/L		95	56 - 136
Trichloroethene	1.0	U	10.0	8.17		ug/L		82	61 - 124
Vinyl chloride	1.0	U	10.0	7.02		ug/L		70	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*110*		*62 - 137*
4-Bromofluorobenzene (Surr)	*86*		*56 - 136*
Toluene-d8 (Surr)	*101*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159830-D-2 MS
Matrix: Water
Analysis Batch: 513667

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*96*		*73 - 120*

Lab Sample ID: 240-159830-E-2 MSD
Matrix: Water
Analysis Batch: 513667

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	7.67		ug/L		77	56 - 135	5	26
cis-1,2-Dichloroethene	1.0	U	10.0	8.48		ug/L		85	66 - 128	9	14
Tetrachloroethene	1.0	U	10.0	8.29		ug/L		83	62 - 131	8	20
trans-1,2-Dichloroethene	1.0	U	10.0	8.31		ug/L		83	56 - 136	13	15
Trichloroethene	1.0	U	10.0	7.56		ug/L		76	61 - 124	8	15
Vinyl chloride	1.0	U	10.0	6.48		ug/L		65	43 - 157	8	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*107*		*62 - 137*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*
Toluene-d8 (Surr)	*97*		*78 - 122*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512785/5
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 18:32	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*66 - 120*		*11/12/21 18:32*	*1*

Lab Sample ID: LCS 240-512785/4
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.7		ug/L		107	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*66 - 120*

Lab Sample ID: 240-159541-G-2 MS
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

Lab Sample ID: 240-159541-M-2 MSD
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.4		ug/L		104	51 - 153	2	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159819-1

GC/MS VOA

Analysis Batch: 512785

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159819-2	MW-97S_110921	Total/NA	Water	8260B SIM	
MB 240-512785/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512785/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159541-G-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159541-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513667

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159819-1	TRIP BLANK_68	Total/NA	Water	8260B	
240-159819-2	MW-97S_110921	Total/NA	Water	8260B	
MB 240-513667/6	Method Blank	Total/NA	Water	8260B	
LCS 240-513667/4	Lab Control Sample	Total/NA	Water	8260B	
240-159830-D-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159830-E-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159819-1

Client Sample ID: TRIP BLANK_68

Lab Sample ID: 240-159819-1

Date Collected: 11/09/21 00:00

Matrix: Water

Date Received: 11/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513667	11/19/21 03:50	LEE	TAL CAN

Client Sample ID: MW-97S_110921

Lab Sample ID: 240-159819-2

Date Collected: 11/09/21 09:05

Matrix: Water

Date Received: 11/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513667	11/19/21 04:12	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512785	11/12/21 20:36	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159819-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Seth Turner		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30080642.402.04	Shipping/Tracking No:		
PO # 30080642.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below

10 day: 3 weeks / ✓ 2 weeks / 1 week / 2 days / 1 day

Analyses

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 68	—	—		X						1							X	X	X	X	X	X	~~X~~ EW	1 Trip Blank
MW-97S_110921	11/9/21	905		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159819 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / ✓ Disposal By Lab / Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Seth Turner	Arcadis	11/9/21/1330	Novi Cold Storage	Arcadis	11/9/21/1330
[signature]	Arcadis	11/10/21 10:40	[signature]	ETA	11/10/21 1041
[signature]	ETA	11/10/21 1041	Received in Laboratory by: [signature]	ETA	11-11-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 159819
Canton Facility

Client Arcadis Site Name

Cooler Received on 11-11-21 Opened on 11-11-21

Cooler unpacked by: Tammy Depp

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # 1A Foam Box Client Cooler Box Other

Packing material used: ~~Bubble Wrap~~ Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 4.5 °C Corrected Cooler Temp. 4.6 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# **HC157842**
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this. (Yes) No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 60358 (Yes) No
17. Was a LL Hg or Me Hg trip blank present? ____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

No SIM on TB per corrected COC. SMR 11/11/21

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

November 26, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159819-1
Sample date: 2021-11-09
Report received by CADENA: 2021-11-26
Initial Data Verification completed by CADENA: 2021-11-26
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159819-1

		Sample Name:	TRIP BLANK_68				MW-97S_110921			
		Lab Sample ID:	2401598191				2401598192			
		Sample Date:	11/9/2021				11/9/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

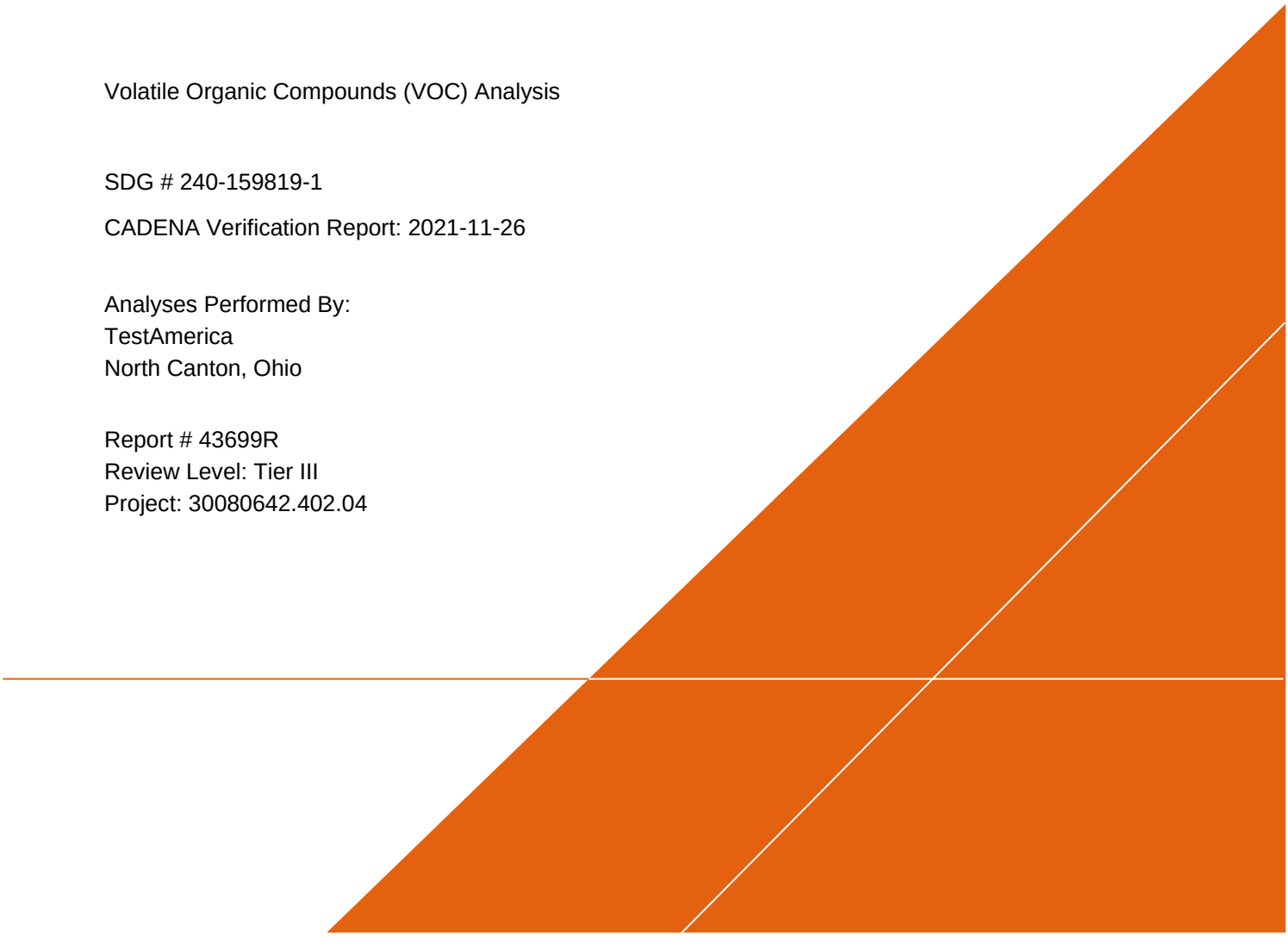
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159819-1

CADENA Verification Report: 2021-11-26

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43699R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159819-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_68	240-159819-1	Water	11/09/21		X	
MW-97S_110921	240-159819-2	Water	11/09/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 13, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Seth Turner	TAT if different from below: 10 day; 3 weeks, ✓ 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_68	—	—		X						1							X	X	X	X	X	X	X	1 Trip Blank
MW-97S_110921	11/9/21	905		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159819 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; ✓ Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Seth Turner	Arcadis	11/9/21 1330	Novi Cold Storage	Arcadis	11/9/21 1330
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	11/10/21 10:40	[signature]	ETA	11/10/21 1041
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
[signature]	ETA	11/10/21 1041	[signature]	ETA	11-11-21 800

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11/26/2021

Client Sample ID: TRIP BLANK_68
Lab Sample ID: 240-159819-1
Date Collected: 11/09/21 00:00
Matrix: Water
Date Received: 11/11/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 03:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 03:50	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 03:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 03:50	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 03:50	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 03:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*121*		*62 - 137*		*11/19/21 03:50*	*1*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*		*11/19/21 03:50*	*1*
Toluene-d8 (Surr)	*115*		*78 - 122*		*11/19/21 03:50*	*1*
Dibromofluoromethane (Surr)	*106*		*73 - 120*		*11/19/21 03:50*	*1*

Client Sample ID: MW-97S_110921
Lab Sample ID: 240-159819-2
Date Collected: 11/09/21 09:05
Matrix: Water
Date Received: 11/11/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 20:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*		*11/12/21 20:36*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 04:12	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 04:12	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 04:12	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 04:12	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 04:12	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 04:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*62 - 137*		*11/19/21 04:12*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/19/21 04:12*	*1*
Toluene-d8 (Surr)	*100*		*78 - 122*		*11/19/21 04:12*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/19/21 04:12*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159541-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/22/2021 10:24:19 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159541-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159541-1

Job ID: 240-159541-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159541-1

Comments
No additional comments.

Receipt
The samples were received on 11/6/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159541-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159541-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159541-1	TRIP BLANK_51	Water	11/04/21 00:00	11/06/21 08:00
240-159541-2	MW-98S_110421	Water	11/04/21 10:45	11/06/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159541-1

Client Sample ID: TRIP BLANK_51 — Lab Sample ID: 240-159541-1

No Detections.

Client Sample ID: MW-98S_110421 — Lab Sample ID: 240-159541-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159541-1

Client Sample ID: TRIP BLANK_51
Date Collected: 11/04/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159541-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/15/21 13:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/15/21 13:07	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 13:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/15/21 13:07	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 13:07	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/15/21 13:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*115*		*62 - 137*		*11/15/21 13:07*	*1*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*		*11/15/21 13:07*	*1*
Toluene-d8 (Surr)	*97*		*78 - 122*		*11/15/21 13:07*	*1*
Dibromofluoromethane (Surr)	*106*		*73 - 120*		*11/15/21 13:07*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159541-1

Client Sample ID: MW-98S_110421
Date Collected: 11/04/21 10:45
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159541-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U F1	2.0	0.86	ug/L			11/12/21 23:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*		*11/12/21 23:05*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/15/21 14:47	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/15/21 14:47	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 14:47	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/15/21 14:47	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 14:47	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/15/21 14:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*118*		*62 - 137*		*11/15/21 14:47*	*1*
4-Bromofluorobenzene (Surr)	*83*		*56 - 136*		*11/15/21 14:47*	*1*
Toluene-d8 (Surr)	*96*		*78 - 122*		*11/15/21 14:47*	*1*
Dibromofluoromethane (Surr)	*108*		*73 - 120*		*11/15/21 14:47*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159541-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159541-1	TRIP BLANK_51	115	85	97	106
240-159541-2	MW-98S_110421	118	83	96	108
240-159541-2 MS	MW-98S-MS_110421	104	104	100	106
240-159541-2 MSD	MW-98S-MSD_110421	103	101	95	102
LCS 240-512931/5	Lab Control Sample	107	100	96	105
MB 240-512931/7	Method Blank	121	87	95	109

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159541-2	MW-98S_110421	75
240-159541-2 MS	MW-98S-MS_110421	77
240-159541-2 MSD	MW-98S-MSD_110421	78
LCS 240-512785/4	Lab Control Sample	79
MB 240-512785/5	Method Blank	79

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512931/7
Matrix: Water
Analysis Batch: 512931

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/15/21 12:17	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/15/21 12:17	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 12:17	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/15/21 12:17	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 12:17	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/15/21 12:17	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*121*		*62 - 137*		*11/15/21 12:17*	*1*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*		*11/15/21 12:17*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*11/15/21 12:17*	*1*
Dibromofluoromethane (Surr)	*109*		*73 - 120*		*11/15/21 12:17*	*1*

Lab Sample ID: LCS 240-512931/5
Matrix: Water
Analysis Batch: 512931

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	25.7		ug/L		103	63 - 134
cis-1,2-Dichloroethene	25.0	24.0		ug/L		96	77 - 123
Tetrachloroethene	25.0	29.9		ug/L		120	76 - 123
trans-1,2-Dichloroethene	25.0	25.4		ug/L		101	75 - 124
Trichloroethene	25.0	25.9		ug/L		104	70 - 122
Vinyl chloride	25.0	26.9		ug/L		108	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*107*		*62 - 137*
4-Bromofluorobenzene (Surr)	*100*		*56 - 136*
Toluene-d8 (Surr)	*96*		*78 - 122*
Dibromofluoromethane (Surr)	*105*		*73 - 120*

Lab Sample ID: 240-159541-2 MS
Matrix: Water
Analysis Batch: 512931

Client Sample ID: MW-98S-MS_110421
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	25.0	23.9		ug/L		95	56 - 135
cis-1,2-Dichloroethene	1.0	U	25.0	22.8		ug/L		91	66 - 128
Tetrachloroethene	1.0	U	25.0	30.6		ug/L		122	62 - 131
trans-1,2-Dichloroethene	1.0	U	25.0	22.7		ug/L		91	56 - 136
Trichloroethene	1.0	U	25.0	23.3		ug/L		93	61 - 124
Vinyl chloride	1.0	U	25.0	23.4		ug/L		94	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*104*		*62 - 137*
4-Bromofluorobenzene (Surr)	*104*		*56 - 136*
Toluene-d8 (Surr)	*100*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159541-2 MS
Matrix: Water
Analysis Batch: 512931

Client Sample ID: MW-98S-MS_110421
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*106*		*73 - 120*

Lab Sample ID: 240-159541-2 MSD
Matrix: Water
Analysis Batch: 512931

Client Sample ID: MW-98S-MSD_110421
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	25.0	22.9		ug/L		91	56 - 135	4	26
cis-1,2-Dichloroethene	1.0	U	25.0	22.5		ug/L		90	66 - 128	1	14
Tetrachloroethene	1.0	U	25.0	30.4		ug/L		121	62 - 131	1	20
trans-1,2-Dichloroethene	1.0	U	25.0	22.2		ug/L		89	56 - 136	2	15
Trichloroethene	1.0	U	25.0	23.2		ug/L		93	61 - 124	0	15
Vinyl chloride	1.0	U	25.0	22.1		ug/L		88	43 - 157	6	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*
4-Bromofluorobenzene (Surr)	*101*		*56 - 136*
Toluene-d8 (Surr)	*95*		*78 - 122*
Dibromofluoromethane (Surr)	*102*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512785/5
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 18:32	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*66 - 120*		*11/12/21 18:32*	*1*

Lab Sample ID: LCS 240-512785/4
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.7		ug/L		107	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*66 - 120*

Lab Sample ID: 240-159541-2 MS
Matrix: Water
Analysis Batch: 512785

Client Sample ID: MW-98S-MS_110421
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

Lab Sample ID: 240-159541-2 MSD
Matrix: Water
Analysis Batch: 512785

Client Sample ID: MW-98S-MSD_110421
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.4		ug/L		104	51 - 153	2	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159541-1

GC/MS VOA

Analysis Batch: 512785

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159541-2	MW-98S_110421	Total/NA	Water	8260B SIM	
MB 240-512785/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512785/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159541-2 MS	MW-98S-MS_110421	Total/NA	Water	8260B SIM	
240-159541-2 MSD	MW-98S-MSD_110421	Total/NA	Water	8260B SIM	

Analysis Batch: 512931

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159541-1	TRIP BLANK_51	Total/NA	Water	8260B	
240-159541-2	MW-98S_110421	Total/NA	Water	8260B	
MB 240-512931/7	Method Blank	Total/NA	Water	8260B	
LCS 240-512931/5	Lab Control Sample	Total/NA	Water	8260B	
240-159541-2 MS	MW-98S-MS_110421	Total/NA	Water	8260B	
240-159541-2 MSD	MW-98S-MSD_110421	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159541-1

Client Sample ID: TRIP BLANK_51

Lab Sample ID: 240-159541-1

Date Collected: 11/04/21 00:00

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512931	11/15/21 13:07	SAM	TAL CAN

Client Sample ID: MW-98S_110421

Lab Sample ID: 240-159541-2

Date Collected: 11/04/21 10:45

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512931	11/15/21 14:47	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	512785	11/12/21 23:05	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159541-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Sam Hinkle / CHRISTINA WEAVER	TAT if different from below: ☐ 3 weeks ☑ 2 weeks (10 day) ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier: COURIER			Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 51	---	---		X						1							X	X	X	X	X	X	X	1 Trip Blank
MW-98S_110421	11/4/21	10:45		6						6							X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-98S-MS_110421	11/4/21	10:45		6						6							X	X	X	X	X	X	X	
MW-98S-MSD_110421	11/4/21	10:45		6						6							X	X	X	X	X	X	X	

240-159541 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
SH	Arcadis	11/4/21 19:11	NOVI COLD STORAGE	ARCADIS	11/4/21 1811
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	ARCADIS	11/5/21 1435		ETA	11/5/21 1435
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
	ETA	11/5/21 1448	M. A.	ETA	11/6/21 8:00

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11/22/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 59541
Canton Facility

Client ARCADIS Site Name

Cooler Received on 11/6/21 Opened on 11/6/21

Cooler unpacked by: Matthew Surma

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.2 °C Corrected Cooler Temp. 0.3 °C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No	(NA) pH Strip Lot# HC157842
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 0104201G	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present?	Yes	(No)

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.

Sample(s) were received in a broken container.

Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.

Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

DATA VERIFICATION REPORT

November 22, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159541-1
Sample date: 2021-11-04
Report received by CADENA: 2021-11-22
Initial Data Verification completed by CADENA: 2021-11-22
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

NOTE: 1,4-dioxane F1 flag assigned to sample -002 in laboratory report was not supported by the batch QC data so flag was not assigned to field data as part of validation review.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, MS/MSD Recovery, MS/MSD RPD, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159541-1

		Sample Name:	TRIP BLANK_51				MW-98S_110421			
		Lab Sample ID:	2401595411				2401595412			
		Sample Date:	11/4/2021				11/4/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

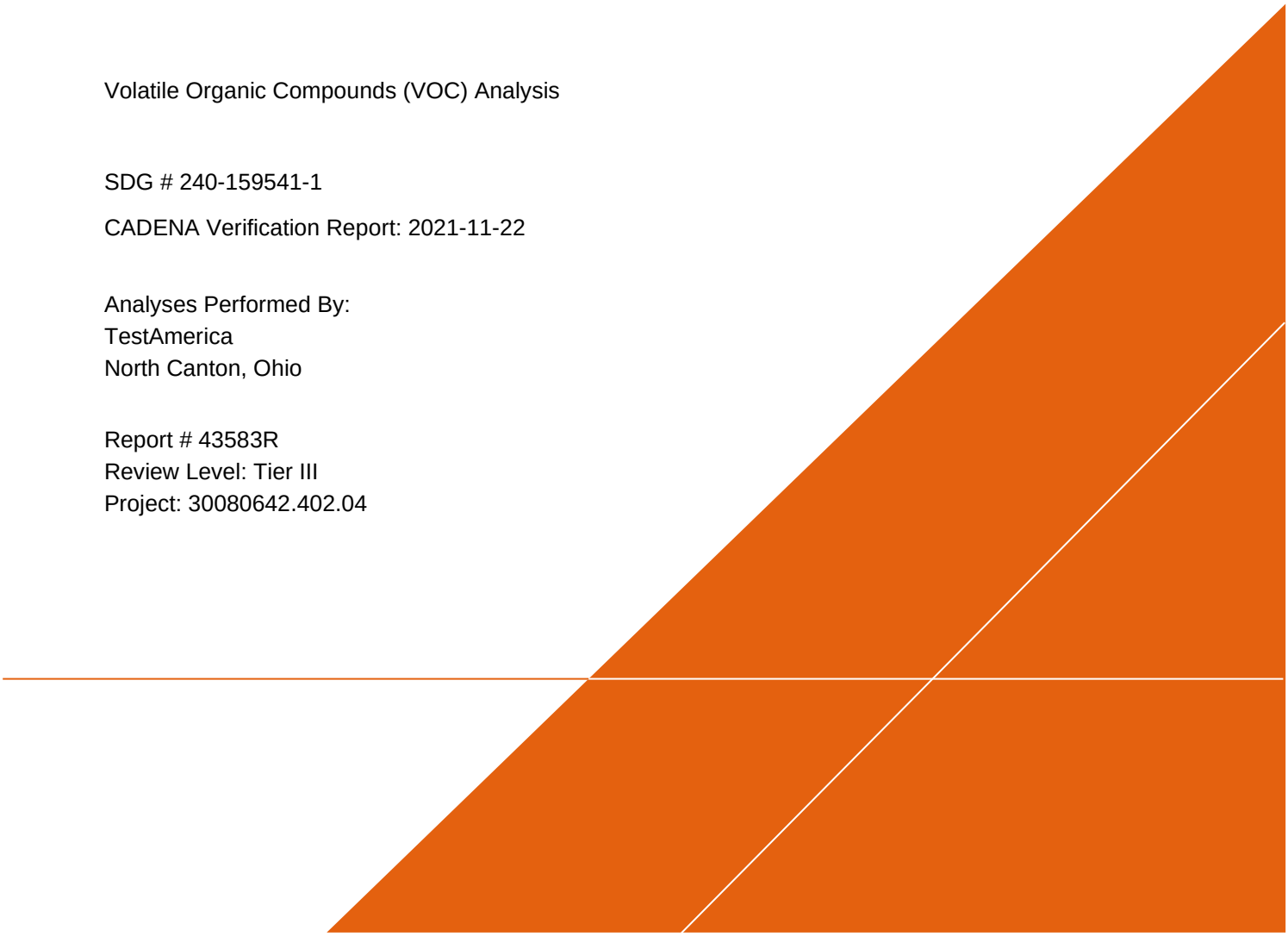
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159541-1

CADENA Verification Report: 2021-11-22

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43583R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159541-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_51	240-159541-1	Water	11/04/21		X	
MW-98S_110421	240-159541-2	Water	11/04/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

DATA REVIEW

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE:

DATE: December 14, 2021

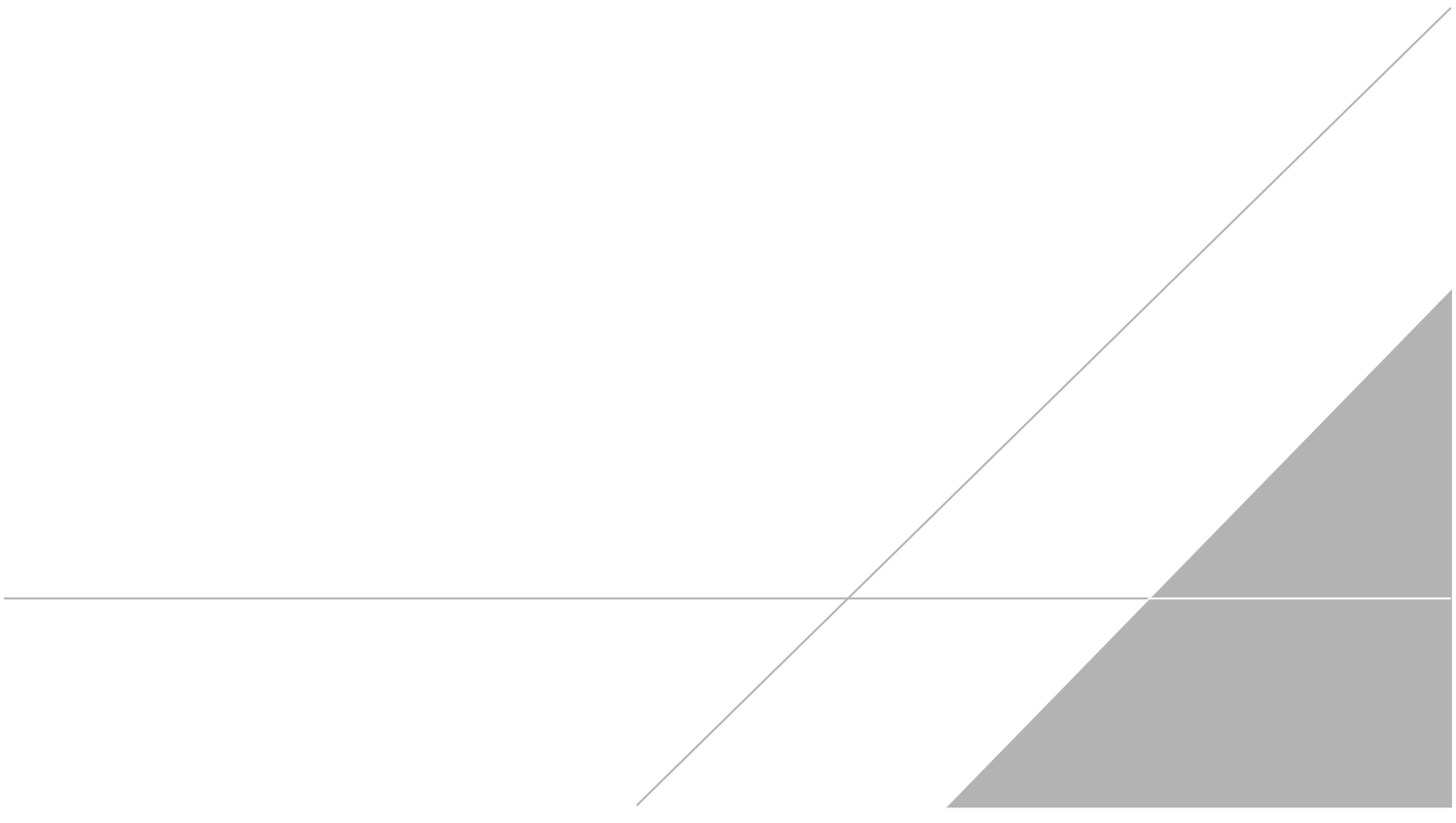
PEER REVIEW: Andrew Korycinski

DATE: December 14, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Sam Hinkle / CHRISTINA WEAVER	TAT if different from below: ☐ 3 weeks ☑ 2 weeks (10 day) ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier: COURIER			Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 51	---	---		X						1							X	X	X	X	X	X	X	1 Trip Blank
MW-98S_110421	11/4/21	10:45		6						6							X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-98S-MS_110421	11/4/21	10:45		6						6							X	X	X	X	X	X	X	
MW-98S-MSD_110421	11/4/21	10:45		6						6							X	X	X	X	X	X	X	

240-159541 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
SH	Arcadis	11/4/21 19:11	NOVI COLD STORAGE	ARCADIS	11/4/21 1811
	ARCADIS	11/5/21 1435		ETA	11/5/21 1435
	ETA	11/5/21 1448	Received in Laboratory by: M. A.	ETA	11/6/21 8:00

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11/22/2021

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159541-1

Client Sample ID: TRIP BLANK_51
Date Collected: 11/04/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159541-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/15/21 13:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/15/21 13:07	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 13:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/15/21 13:07	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 13:07	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/15/21 13:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*115*		*62 - 137*		*11/15/21 13:07*	*1*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*		*11/15/21 13:07*	*1*
Toluene-d8 (Surr)	*97*		*78 - 122*		*11/15/21 13:07*	*1*
Dibromofluoromethane (Surr)	*106*		*73 - 120*		*11/15/21 13:07*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159541-1

Client Sample ID: MW-98S_110421
Date Collected: 11/04/21 10:45
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159541-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U ~~F1~~	2.0	0.86	ug/L			11/12/21 23:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*		*11/12/21 23:05*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/15/21 14:47	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/15/21 14:47	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 14:47	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/15/21 14:47	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 14:47	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/15/21 14:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*118*		*62 - 137*		*11/15/21 14:47*	*1*
4-Bromofluorobenzene (Surr)	*83*		*56 - 136*		*11/15/21 14:47*	*1*
Toluene-d8 (Surr)	*96*		*78 - 122*		*11/15/21 14:47*	*1*
Dibromofluoromethane (Surr)	*108*		*73 - 120*		*11/15/21 14:47*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-160622-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
12/9/2021 11:48:03 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
Review your project results through TotalAccess
Have a Question? Ask The Expert
Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160622-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-160622-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-160622-1

Comments
No additional comments.

Receipt
The samples were received on 11/23/2021 10:40 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.4º C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) for analytical batch 515372 exceeded control criteria for one or multiple compounds. The samples associated with this CCV were non-detect for the affected analytes. In accordance with the laboratory SOP, a low level CCV at the reporting limit (labeled as an MRL) was analyzed and the affected compounds were detected; therefore the data has been reported. No further corrective action was required: TRIP BLANK_175 (240-160622-1) and MW-101S_111921 (240-160622-2).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160622-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160622-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-160622-1	TRIP BLANK_175	Water	11/19/21 00:00	11/23/21 10:40
240-160622-2	MW-101S_111921	Water	11/19/21 13:15	11/23/21 10:40

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160622-1

Client Sample ID: TRIP BLANK_175 — Lab Sample ID: 240-160622-1

No Detections.

Client Sample ID: MW-101S_111921 — Lab Sample ID: 240-160622-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160622-1

Client Sample ID: TRIP BLANK_175
Date Collected: 11/19/21 00:00
Date Received: 11/23/21 10:40

Lab Sample ID: 240-160622-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			12/02/21 21:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			12/02/21 21:50	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			12/02/21 21:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			12/02/21 21:50	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			12/02/21 21:50	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			12/02/21 21:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*126*		*62 - 137*		*12/02/21 21:50*	*1*
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*12/02/21 21:50*	*1*
Toluene-d8 (Surr)	*86*		*78 - 122*		*12/02/21 21:50*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*12/02/21 21:50*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160622-1

Client Sample ID: MW-101S_111921
Date Collected: 11/19/21 13:15
Date Received: 11/23/21 10:40

Lab Sample ID: 240-160622-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/25/21 04:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*		*11/25/21 04:21*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			12/02/21 22:12	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			12/02/21 22:12	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			12/02/21 22:12	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			12/02/21 22:12	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			12/02/21 22:12	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			12/02/21 22:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*125*		*62 - 137*		*12/02/21 22:12*	*1*
4-Bromofluorobenzene (Surr)	*69*		*56 - 136*		*12/02/21 22:12*	*1*
Toluene-d8 (Surr)	*86*		*78 - 122*		*12/02/21 22:12*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*12/02/21 22:12*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160622-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-160599-C-1 MS	Matrix Spike	98	102	102	81
240-160599-H-1 MSD	Matrix Spike Duplicate	98	101	101	79
240-160622-1	TRIP BLANK_175	126	73	86	100
240-160622-2	MW-101S_111921	125	69	86	99
LCS 240-515372/4	Lab Control Sample	98	102	102	79
MB 240-515372/7	Method Blank	117	76	91	92

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-160508-G-4 MS	Matrix Spike	75
240-160508-M-4 MSD	Matrix Spike Duplicate	75
240-160622-2	MW-101S_111921	75
LCS 240-514583/4	Lab Control Sample	75
MB 240-514583/5	Method Blank	75

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-515372/7
Matrix: Water
Analysis Batch: 515372

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			12/02/21 13:28	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			12/02/21 13:28	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			12/02/21 13:28	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			12/02/21 13:28	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			12/02/21 13:28	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			12/02/21 13:28	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*62 - 137*		*12/02/21 13:28*	*1*
4-Bromofluorobenzene (Surr)	*76*		*56 - 136*		*12/02/21 13:28*	*1*
Toluene-d8 (Surr)	*91*		*78 - 122*		*12/02/21 13:28*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*12/02/21 13:28*	*1*

Lab Sample ID: LCS 240-515372/4
Matrix: Water
Analysis Batch: 515372

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.55		ug/L		86	63 - 134
cis-1,2-Dichloroethene	10.0	9.74		ug/L		97	77 - 123
Tetrachloroethene	10.0	9.20		ug/L		92	76 - 123
trans-1,2-Dichloroethene	10.0	9.69		ug/L		97	75 - 124
Trichloroethene	10.0	8.31		ug/L		83	70 - 122
Vinyl chloride	10.0	7.65		ug/L		77	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*
4-Bromofluorobenzene (Surr)	*102*		*56 - 136*
Toluene-d8 (Surr)	*102*		*78 - 122*
Dibromofluoromethane (Surr)	*79*		*73 - 120*

Lab Sample ID: 240-160599-C-1 MS
Matrix: Water
Analysis Batch: 515372

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	8.09		ug/L		81	56 - 135
cis-1,2-Dichloroethene	1.5		10.0	10.5		ug/L		91	66 - 128
Tetrachloroethene	1.0	U	10.0	8.68		ug/L		87	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.65		ug/L		96	56 - 136
Trichloroethene	1.0	U	10.0	8.23		ug/L		82	61 - 124
Vinyl chloride	0.64	J	10.0	7.39		ug/L		67	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*
4-Bromofluorobenzene (Surr)	*102*		*56 - 136*
Toluene-d8 (Surr)	*102*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-160599-C-1 MS
Matrix: Water
Analysis Batch: 515372

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*81*		*73 - 120*

Lab Sample ID: 240-160599-H-1 MSD
Matrix: Water
Analysis Batch: 515372

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	8.17		ug/L		82	56 - 135	1	26
cis-1,2-Dichloroethene	1.5		10.0	10.7		ug/L		92	66 - 128	1	14
Tetrachloroethene	1.0	U	10.0	8.78		ug/L		88	62 - 131	1	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.65		ug/L		97	56 - 136	0	15
Trichloroethene	1.0	U	10.0	8.32		ug/L		83	61 - 124	1	15
Vinyl chloride	0.64	J	10.0	7.33		ug/L		67	43 - 157	1	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*
4-Bromofluorobenzene (Surr)	*101*		*56 - 136*
Toluene-d8 (Surr)	*101*		*78 - 122*
Dibromofluoromethane (Surr)	*79*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-514583/5
Matrix: Water
Analysis Batch: 514583

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/24/21 20:04	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*		*11/24/21 20:04*	*1*

Lab Sample ID: LCS 240-514583/4
Matrix: Water
Analysis Batch: 514583

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.2		ug/L		102	80 - 122		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*

Lab Sample ID: 240-160508-G-4 MS
Matrix: Water
Analysis Batch: 514583

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	1.0	J F1	10.0	11.9		ug/L		109	51 - 153		

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*

Lab Sample ID: 240-160508-M-4 MSD
Matrix: Water
Analysis Batch: 514583

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	1.0	J F1	10.0	10.5		ug/L		95	51 - 153	13	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160622-1

GC/MS VOA

Analysis Batch: 514583

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-160622-2	MW-101S_111921	Total/NA	Water	8260B SIM	
MB 240-514583/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-514583/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-160508-G-4 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-160508-M-4 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 515372

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-160622-1	TRIP BLANK_175	Total/NA	Water	8260B	
240-160622-2	MW-101S_111921	Total/NA	Water	8260B	
MB 240-515372/7	Method Blank	Total/NA	Water	8260B	
LCS 240-515372/4	Lab Control Sample	Total/NA	Water	8260B	
240-160599-C-1 MS	Matrix Spike	Total/NA	Water	8260B	
240-160599-H-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160622-1

Client Sample ID: TRIP BLANK_175

Lab Sample ID: 240-160622-1

Date Collected: 11/19/21 00:00

Matrix: Water

Date Received: 11/23/21 10:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	515372	12/02/21 21:50	LEE	TAL CAN

Client Sample ID: MW-101S_111921

Lab Sample ID: 240-160622-2

Date Collected: 11/19/21 13:15

Matrix: Water

Date Received: 11/23/21 10:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	515372	12/02/21 22:12	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	514583	11/25/21 04:21	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160622-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190 1-3|1-4

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Sam Hindel / COURIER: CHRISTINA WERNER	TAT if different from below: 10 day ✓ 2 weeks; 3 weeks; 1 week; 2 days; 1 day		Walk-in client; Lab sampling
Phone: 248-994-2240	Method of Shipment/Carrier:			Job/SDG No:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_175	—	—		X						1					N	G	X	X	X	X	X	X	X (w)	1 Trip Blank
MW-1015-111921	11/19/21	13:15		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-160622 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; ✓ Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company:	Date/Time:		Company:	Date/Time:
Relinquished by:	Arcadis	11/19/21 15:20	Received by: Non cold storage	Arcadis	11/19/21 15:20
Relinquished by:	ARCADIS	11/22/21	Received by:	ETA	11/22/21
Relinquished by:	ETA	11/23/21	Received in Laboratory by:	ETA	11/23/21 10:40

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12/9/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 160622

Client Arcadis Site Name

Cooler Received on 11/23/21 Opened on 11/23/21

Cooler unpacked by: Matthew Swma

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # 1 A Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 1.3 °C Corrected Cooler Temp. 1.4 °C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?	Yes	No
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC157842
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 0226201F	Yes	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

No SIM on TB per corrected COC. DMF 11/23/21

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.

Sample(s) ____ were received in a broken container.

Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.

Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

December 09, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 160622-1
Sample date: 2021-11-19
Report received by CADENA: 2021-12-09
Initial Data Verification completed by CADENA: 2021-12-09
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 160622-1

		Sample Name:	TRIP BLANK_175				MW-101S_111921			
		Lab Sample ID:	2401606221				2401606222			
		Sample Date:	11/19/2021				11/19/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

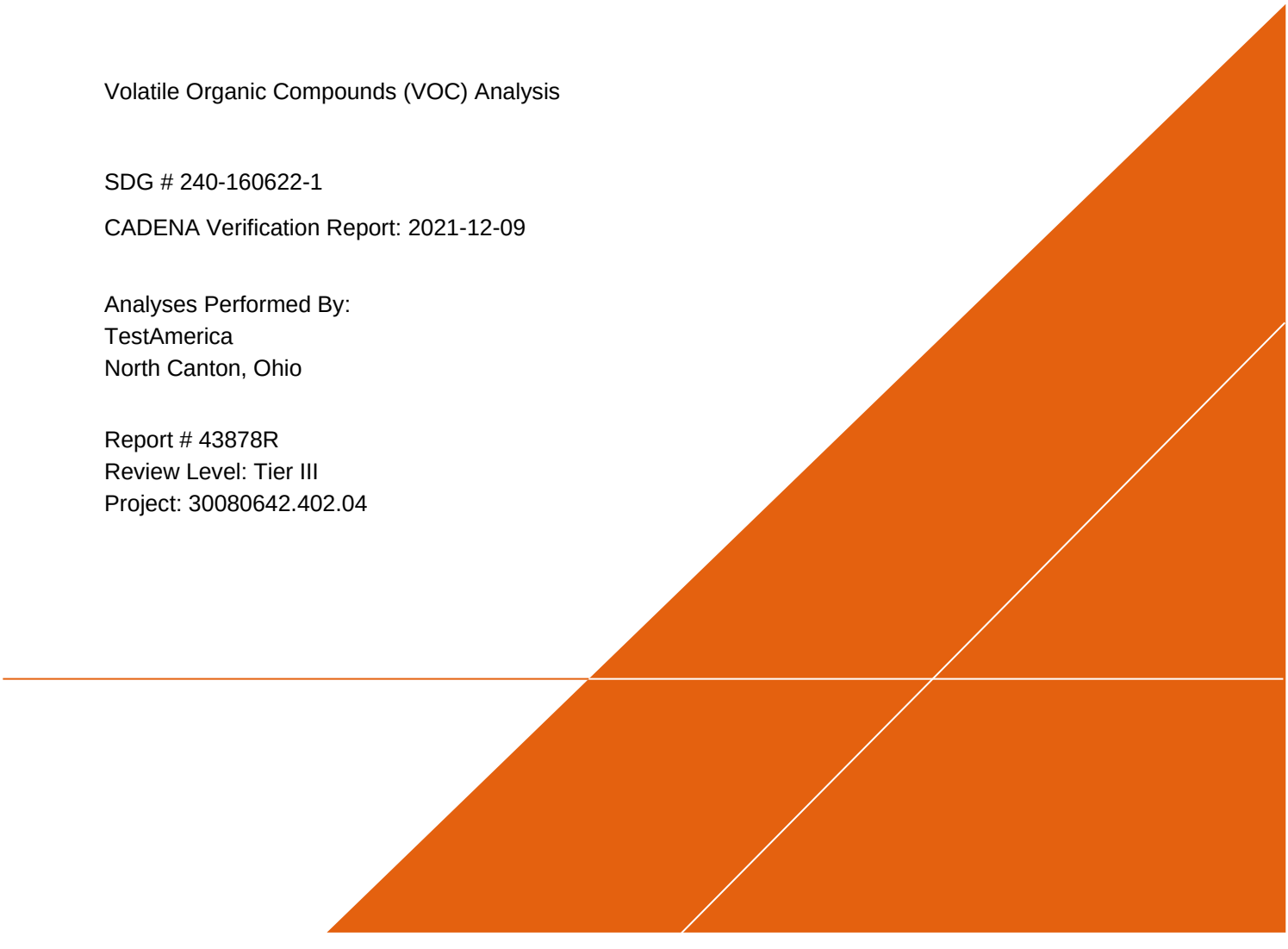
Volatile Organic Compounds (VOC) Analysis

SDG # 240-160622-1

CADENA Verification Report: 2021-12-09

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43878R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-160622-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_175	240-160622-1	Water	11/19/21		X	
MW-101S_111921	240-160622-2	Water	11/19/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Compound	Criteria
TRIP BLANK_175 MW-101S_111921	Continuous Calibration Verification %D	Vinyl chloride	-23.6%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	

Initial/Continuing	Criteria	Sample Result	Qualification
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 20, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 20, 2021

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190 1-3|1-4

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	DW NPDES RCRA Other	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500		Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377		Sampler Name: Sam Hyndell / COURIER: CHRISTINA WEAVER	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Phone: 248-994-2240		Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site		Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04					
PO # 30080642.402.04					

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_175	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1015-111921	11/19/21	13:15		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-160622 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company:	Date/Time:		Company:	Date/Time:
Relinquished by:	Arcadis	11/19/21 15:20	Received by: Non cold storage	Arcadis	11/19/21 15:20
Relinquished by:	ARCADIS	11/22/21	Received by:	ETA	11/22/21
Relinquished by:	ETA	11/22/21	Received in Laboratory by:	ETA	11/23/21 10:40

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Client Sample ID: TRIP BLANK_175
Lab Sample ID: 240-160622-1
Date Collected: 11/19/21 00:00
Matrix: Water
Date Received: 11/23/21 10:40

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			12/02/21 21:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			12/02/21 21:50	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			12/02/21 21:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			12/02/21 21:50	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			12/02/21 21:50	1
Vinyl chloride	1.0	~~U~~ UJ	1.0	0.45	ug/L			12/02/21 21:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*126*		*62 - 137*		*12/02/21 21:50*	*1*
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*12/02/21 21:50*	*1*
Toluene-d8 (Surr)	*86*		*78 - 122*		*12/02/21 21:50*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*12/02/21 21:50*	*1*

Client Sample ID: MW-101S_111921
Lab Sample ID: 240-160622-2
Date Collected: 11/19/21 13:15
Matrix: Water
Date Received: 11/23/21 10:40

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/25/21 04:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*		*11/25/21 04:21*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			12/02/21 22:12	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			12/02/21 22:12	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			12/02/21 22:12	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			12/02/21 22:12	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			12/02/21 22:12	1
Vinyl chloride	1.0	~~U~~ UJ	1.0	0.45	ug/L			12/02/21 22:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*125*		*62 - 137*		*12/02/21 22:12*	*1*
4-Bromofluorobenzene (Surr)	*69*		*56 - 136*		*12/02/21 22:12*	*1*
Toluene-d8 (Surr)	*86*		*78 - 122*		*12/02/21 22:12*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*12/02/21 22:12*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159546-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/22/2021 10:25:28 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
Review your project results through TotalAccess
Have a Question? Ask The Expert
Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159546-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159546-1

Job ID: 240-159546-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159546-1

Comments
No additional comments.

Receipt
The samples were received on 11/6/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.3º C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) for analytical batch 512819 exceeded control criteria for Vinyl Chloride. The samples associated with this CCV were non-detect for the affected analytes. In accordance with the laboratory SOP, a low level CCV at the reporting limit (labeled as an MRL) was analyzed and the affected compounds were detected; therefore the data has been reported. No further corrective action was required: TRIP BLANK_53 (240-159546-1), MW-105S_110321 (240-159546-2) and MW-102S_110321 (240-159546-3).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159546-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159546-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159546-1	TRIP BLANK_53	Water	11/03/21 00:00	11/06/21 08:00
240-159546-2	MW-105S_110321	Water	11/03/21 12:10	11/06/21 08:00
240-159546-3	MW-102S_110321	Water	11/03/21 14:55	11/06/21 08:00
240-159546-4	MW-102_110321	Water	11/03/21 16:45	11/06/21 08:00
240-159546-5	DUP-14	Water	11/03/21 00:00	11/06/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159546-1

Client Sample ID: TRIP BLANK_53 — Lab Sample ID: 240-159546-1

No Detections.

Client Sample ID: MW-105S_110321 — Lab Sample ID: 240-159546-2

No Detections.

Client Sample ID: MW-102S_110321 — Lab Sample ID: 240-159546-3

No Detections.

Client Sample ID: MW-102_110321 — Lab Sample ID: 240-159546-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	2.8		1.0	0.45	ug/L	1		8260B	Total/NA

Client Sample ID: DUP-14 — Lab Sample ID: 240-159546-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	2.7		1.0	0.45	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159546-1

Client Sample ID: TRIP BLANK_53

Date Collected: 11/03/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159546-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 20:51	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 20:51	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 20:51	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 20:51	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 20:51	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 20:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*130*		*62 - 137*		*11/13/21 20:51*	*1*
4-Bromofluorobenzene (Surr)	*67*		*56 - 136*		*11/13/21 20:51*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/13/21 20:51*	*1*
Dibromofluoromethane (Surr)	*115*		*73 - 120*		*11/13/21 20:51*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159546-1

Client Sample ID: MW-105S_110321
Date Collected: 11/03/21 12:10
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159546-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U F1	2.0	0.86	ug/L			11/16/21 21:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/16/21 21:00*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 21:13	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 21:13	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 21:13	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 21:13	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 21:13	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 21:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*129*		*62 - 137*		*11/13/21 21:13*	*1*
4-Bromofluorobenzene (Surr)	*67*		*56 - 136*		*11/13/21 21:13*	*1*
Toluene-d8 (Surr)	*88*		*78 - 122*		*11/13/21 21:13*	*1*
Dibromofluoromethane (Surr)	*112*		*73 - 120*		*11/13/21 21:13*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159546-1

Client Sample ID: MW-102S_110321
Date Collected: 11/03/21 14:55
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159546-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/13/21 00:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*11/13/21 00:51*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 21:35	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 21:35	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 21:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 21:35	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 21:35	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 21:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*127*		*62 - 137*		*11/13/21 21:35*	*1*
4-Bromofluorobenzene (Surr)	*66*		*56 - 136*		*11/13/21 21:35*	*1*
Toluene-d8 (Surr)	*88*		*78 - 122*		*11/13/21 21:35*	*1*
Dibromofluoromethane (Surr)	*114*		*73 - 120*		*11/13/21 21:35*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159546-1

Client Sample ID: MW-102_110321
Date Collected: 11/03/21 16:45
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159546-4
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/13/21 01:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*		*11/13/21 01:15*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/15/21 13:39	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/15/21 13:39	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 13:39	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/15/21 13:39	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 13:39	1
Vinyl chloride	**2.8**		1.0	0.45	ug/L			11/15/21 13:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*124*		*62 - 137*		*11/15/21 13:39*	*1*
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*11/15/21 13:39*	*1*
Toluene-d8 (Surr)	*90*		*78 - 122*		*11/15/21 13:39*	*1*
Dibromofluoromethane (Surr)	*107*		*73 - 120*		*11/15/21 13:39*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159546-1

Client Sample ID: DUP-14

Date Collected: 11/03/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159546-5

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/13/21 01:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*66 - 120*		*11/13/21 01:38*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/15/21 14:01	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/15/21 14:01	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 14:01	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/15/21 14:01	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 14:01	1
Vinyl chloride	**2.7**		1.0	0.45	ug/L			11/15/21 14:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*125*		*62 - 137*		*11/15/21 14:01*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/15/21 14:01*	*1*
Toluene-d8 (Surr)	*88*		*78 - 122*		*11/15/21 14:01*	*1*
Dibromofluoromethane (Surr)	*108*		*73 - 120*		*11/15/21 14:01*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159546-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159546-1	TRIP BLANK_53	130	67	89	115
240-159546-2	MW-105S_110321	129	67	88	112
240-159546-2 MS	MW-105S-MS_110321	105	96	102	93
240-159546-2 MSD	MW-105S-MSD_110321	102	98	101	91
240-159546-3	MW-102S_110321	127	66	88	114
240-159546-4	MW-102_110321	124	73	90	107
240-159546-5	DUP-14	125	70	88	108
240-159554-E-1 MSD	Matrix Spike Duplicate	101	101	102	91
240-159554-H-1 MS	Matrix Spike	107	101	102	98
LCS 240-512819/4	Lab Control Sample	100	99	100	91
LCS 240-512968/4	Lab Control Sample	103	100	101	93
MB 240-512819/7	Method Blank	119	75	89	102
MB 240-512968/7	Method Blank	120	74	89	106

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159543-G-3 MS	Matrix Spike	85
240-159543-O-3 MSD	Matrix Spike Duplicate	83
240-159546-2	MW-105S_110321	84
240-159546-2 MS	MW-105S-MS_110321	82
240-159546-2 MSD	MW-105S-MSD_110321	85
240-159546-3	MW-102S_110321	82
240-159546-4	MW-102_110321	87
240-159546-5	DUP-14	86
LCS 240-512758/4	Lab Control Sample	83
LCS 240-513286/4	Lab Control Sample	82
MB 240-512758/5	Method Blank	84
MB 240-513286/5	Method Blank	85

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512819/7
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 13:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 13:57	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 13:57	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:57	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 13:57	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*62 - 137*		*11/13/21 13:57*	*1*
4-Bromofluorobenzene (Surr)	*75*		*56 - 136*		*11/13/21 13:57*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/13/21 13:57*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/13/21 13:57*	*1*

Lab Sample ID: LCS 240-512819/4
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.01		ug/L		90	63 - 134
cis-1,2-Dichloroethene	10.0	10.7		ug/L		107	77 - 123
Tetrachloroethene	10.0	9.49		ug/L		95	76 - 123
trans-1,2-Dichloroethene	10.0	11.0		ug/L		110	75 - 124
Trichloroethene	10.0	9.48		ug/L		95	70 - 122
Vinyl chloride	10.0	8.38		ug/L		84	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*99*		*56 - 136*
Toluene-d8 (Surr)	*100*		*78 - 122*
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Lab Sample ID: 240-159546-2 MS
Matrix: Water
Analysis Batch: 512819

Client Sample ID: MW-105S-MS_110321
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	7.61		ug/L		76	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.48		ug/L		95	66 - 128
Tetrachloroethene	1.0	U	10.0	7.41		ug/L		74	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.49		ug/L		95	56 - 136
Trichloroethene	1.0	U	10.0	7.75		ug/L		77	61 - 124
Vinyl chloride	1.0	U	10.0	7.30		ug/L		73	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*
4-Bromofluorobenzene (Surr)	*96*		*56 - 136*
Toluene-d8 (Surr)	*102*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159546-2 MS
Matrix: Water
Analysis Batch: 512819

Client Sample ID: MW-105S-MS_110321
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*93*		*73 - 120*

Lab Sample ID: 240-159546-2 MSD
Matrix: Water
Analysis Batch: 512819

Client Sample ID: MW-105S-MSD_110321
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	8.50		ug/L		85	56 - 135	11	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.62		ug/L		96	66 - 128	1	14
Tetrachloroethene	1.0	U	10.0	8.67		ug/L		87	62 - 131	16	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.76		ug/L		98	56 - 136	3	15
Trichloroethene	1.0	U	10.0	8.44		ug/L		84	61 - 124	9	15
Vinyl chloride	1.0	U	10.0	7.09		ug/L		71	43 - 157	3	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*
4-Bromofluorobenzene (Surr)	*98*		*56 - 136*
Toluene-d8 (Surr)	*101*		*78 - 122*
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Lab Sample ID: MB 240-512968/7
Matrix: Water
Analysis Batch: 512968

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/15/21 12:55	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/15/21 12:55	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 12:55	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/15/21 12:55	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 12:55	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/15/21 12:55	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*120*		*62 - 137*		*11/15/21 12:55*	*1*
4-Bromofluorobenzene (Surr)	*74*		*56 - 136*		*11/15/21 12:55*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/15/21 12:55*	*1*
Dibromofluoromethane (Surr)	*106*		*73 - 120*		*11/15/21 12:55*	*1*

Lab Sample ID: LCS 240-512968/4
Matrix: Water
Analysis Batch: 512968

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,1-Dichloroethene			10.0	7.79		ug/L		78	63 - 134		
cis-1,2-Dichloroethene			10.0	10.4		ug/L		104	77 - 123		
Tetrachloroethene			10.0	9.14		ug/L		91	76 - 123		
trans-1,2-Dichloroethene			10.0	10.5		ug/L		105	75 - 124		
Trichloroethene			10.0	9.43		ug/L		94	70 - 122		

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-512968/4
Matrix: Water
Analysis Batch: 512968

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Vinyl chloride			10.0	7.99		ug/L		80	60 - 144		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*
4-Bromofluorobenzene (Surr)	*100*		*56 - 136*
Toluene-d8 (Surr)	*101*		*78 - 122*
Dibromofluoromethane (Surr)	*93*		*73 - 120*

Lab Sample ID: 240-159554-E-1 MSD
Matrix: Water
Analysis Batch: 512968

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.29		ug/L		93	56 - 135	5	26
cis-1,2-Dichloroethene	1.0	U	10.0	10.5		ug/L		105	66 - 128	2	14
Tetrachloroethene	0.69	J	10.0	10.3		ug/L		96	62 - 131	10	20
trans-1,2-Dichloroethene	1.0	U	10.0	11.0		ug/L		110	56 - 136	1	15
Trichloroethene	1.0	U	10.0	9.69		ug/L		97	61 - 124	6	15
Vinyl chloride	1.0	U	10.0	7.94		ug/L		79	43 - 157	4	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*101*		*62 - 137*
4-Bromofluorobenzene (Surr)	*101*		*56 - 136*
Toluene-d8 (Surr)	*102*		*78 - 122*
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Lab Sample ID: 240-159554-H-1 MS
Matrix: Water
Analysis Batch: 512968

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,1-Dichloroethene	1.0	U	10.0	8.82		ug/L		88	56 - 135		
cis-1,2-Dichloroethene	1.0	U	10.0	10.3		ug/L		103	66 - 128		
Tetrachloroethene	0.69	J	10.0	9.36		ug/L		87	62 - 131		
trans-1,2-Dichloroethene	1.0	U	10.0	10.9		ug/L		109	56 - 136		
Trichloroethene	1.0	U	10.0	9.16		ug/L		92	61 - 124		
Vinyl chloride	1.0	U	10.0	8.27		ug/L		83	43 - 157		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*107*		*62 - 137*
4-Bromofluorobenzene (Surr)	*101*		*56 - 136*
Toluene-d8 (Surr)	*102*		*78 - 122*
Dibromofluoromethane (Surr)	*98*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512758/5
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 16:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/12/21 16:51*	*1*

Lab Sample ID: LCS 240-512758/4
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	9.63		ug/L		96	80 - 122		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

Lab Sample ID: 240-159543-G-3 MS
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U F1	10.0	9.98		ug/L		100	51 - 153		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

Lab Sample ID: 240-159543-O-3 MSD
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.71		ug/L		97	51 - 153	3	16

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

Lab Sample ID: MB 240-513286/5
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/16/21 19:44	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/16/21 19:44*	*1*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-513286/4
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	9.78		ug/L		98	80 - 122		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159546-2 MS
Matrix: Water
Analysis Batch: 513286

Client Sample ID: MW-105S-MS_110321
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U F1	10.0	11.0		ug/L		110	51 - 153		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159546-2 MSD
Matrix: Water
Analysis Batch: 513286

Client Sample ID: MW-105S-MSD_110321
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.83		ug/L		98	51 - 153	11	16

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

GC/MS VOA

Analysis Batch: 512758

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159546-3	MW-102S_110321	Total/NA	Water	8260B SIM	
240-159546-4	MW-102_110321	Total/NA	Water	8260B SIM	
240-159546-5	DUP-14	Total/NA	Water	8260B SIM	
MB 240-512758/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512758/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159543-G-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159543-O-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 512819

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159546-1	TRIP BLANK_53	Total/NA	Water	8260B	
240-159546-2	MW-105S_110321	Total/NA	Water	8260B	
240-159546-3	MW-102S_110321	Total/NA	Water	8260B	
MB 240-512819/7	Method Blank	Total/NA	Water	8260B	
LCS 240-512819/4	Lab Control Sample	Total/NA	Water	8260B	
240-159546-2 MS	MW-105S-MS_110321	Total/NA	Water	8260B	
240-159546-2 MSD	MW-105S-MSD_110321	Total/NA	Water	8260B	

Analysis Batch: 512968

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159546-4	MW-102_110321	Total/NA	Water	8260B	
240-159546-5	DUP-14	Total/NA	Water	8260B	
MB 240-512968/7	Method Blank	Total/NA	Water	8260B	
LCS 240-512968/4	Lab Control Sample	Total/NA	Water	8260B	
240-159554-E-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	
240-159554-H-1 MS	Matrix Spike	Total/NA	Water	8260B	

Analysis Batch: 513286

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159546-2	MW-105S_110321	Total/NA	Water	8260B SIM	
MB 240-513286/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513286/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159546-2 MS	MW-105S-MS_110321	Total/NA	Water	8260B SIM	
240-159546-2 MSD	MW-105S-MSD_110321	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159546-1

Client Sample ID: TRIP BLANK_53
Lab Sample ID: 240-159546-1
Date Collected: 11/03/21 00:00
Matrix: Water
Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512819	11/13/21 20:51	LEE	TAL CAN

Client Sample ID: MW-105S_110321
Lab Sample ID: 240-159546-2
Date Collected: 11/03/21 12:10
Matrix: Water
Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512819	11/13/21 21:13	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513286	11/16/21 21:00	CS	TAL CAN

Client Sample ID: MW-102S_110321
Lab Sample ID: 240-159546-3
Date Collected: 11/03/21 14:55
Matrix: Water
Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512819	11/13/21 21:35	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512758	11/13/21 00:51	CS	TAL CAN

Client Sample ID: MW-102_110321
Lab Sample ID: 240-159546-4
Date Collected: 11/03/21 16:45
Matrix: Water
Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512968	11/15/21 13:39	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512758	11/13/21 01:15	CS	TAL CAN

Client Sample ID: DUP-14
Lab Sample ID: 240-159546-5
Date Collected: 11/03/21 00:00
Matrix: Water
Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512968	11/15/21 14:01	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512758	11/13/21 01:38	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159546-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: SAM HINDLE COURIER – CHRISTINA WEAVER	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client: Lab sampling:
Phone: 248-994-2240	Method of Shipment/Carrier:			Job/SDG No:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac / NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM				Sample Specific Notes / Special Instructions:
TRIP BLANK_ 53	---	---		X						1					N	G	X	X	X	X	X	X	X				1 Trip Blank
MW-105S_110321	11/3/21	1210		6						6					N	G	X	X	X	X	X	X	X				3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-105S-MS_110321	11/3/21	1210		5						5					N	G	X	X	X	X	X	X	X				ONLY 5 VOAS RUN MS/MSD
MW-105S-MSD_110321	11/3/21	1210		6						6					N	G	X	X	X	X	X	X	X				RUN MS/MSD
MW-102S_110321	11/3/21	1455		6						6					N	G	X	X	X	X	X	X	X				
MW-102_110321	11/3/21	1645		6						6					N	G	X	X	X	X	X	X	X				
DUP-14	11/3/21	—		5						5					N	G	X	X	X	X	X	X	X				ONLY 5 VOAS

240-159546 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be ☐ Return to Client ☑ Disposal By Lab Archive For Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com, Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
SH / Christina Weaver	ARCADIS	11/3/21 / 1800	NOVI COLD STORAGE	ARCADIS	11/3/21 / 1800
Christina Weaver	ARCADIS	11/5/21 1435	Jeri Hall	ETA	11/5/21 / 1435
Jeri Hall	ETA	11/5/21 1448	M. ★. ★.	ETA	11/6/21 8:00

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11/22/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 159546

Client ARCADIS Site Name

Cooler Received on 11/6/21 Opened on 11/6/21

Cooler unpacked by: Matthew Surma

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.2 °C Corrected Cooler Temp. 0.3 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y)N), # of containers (Y)N), and sample type of grab/comp(Y)N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# HC157842
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 0109201G (Yes) No
17. Was a LL Hg or Me Hg trip blank present? Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container.
Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.
Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

DATA VERIFICATION REPORT

November 22, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159546-1
Sample date: 2021-11-03
Report received by CADENA: 2021-11-22
Initial Data Verification completed by CADENA: 2021-11-22
Number of Samples:5
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

> NOTE: 1,4-dioxane F1 flag assigned to sample -002 in laboratory report was not supported by the batch QC data so flag was not assigned to field data as part of validation review.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, MS/MSD Recovery, MS/MSD RPD, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159546-1

	Sample Name:	TRIP BLANK_53				MW-105S_110321				MW-102S_110321				MW-102_110321				DUP-14			
	Lab Sample ID:	2401595461				2401595462				2401595463				2401595464				2401595465			
	Sample Date:	11/3/2021				11/3/2021				11/3/2021				11/3/2021				11/3/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC																					
OSW-8260B																					
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	2.8	1.0	ug/l	---	2.7	1.0	ug/l	---
OSW-8260BBSim																					
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---	ND	2.0	ug/l	---	ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

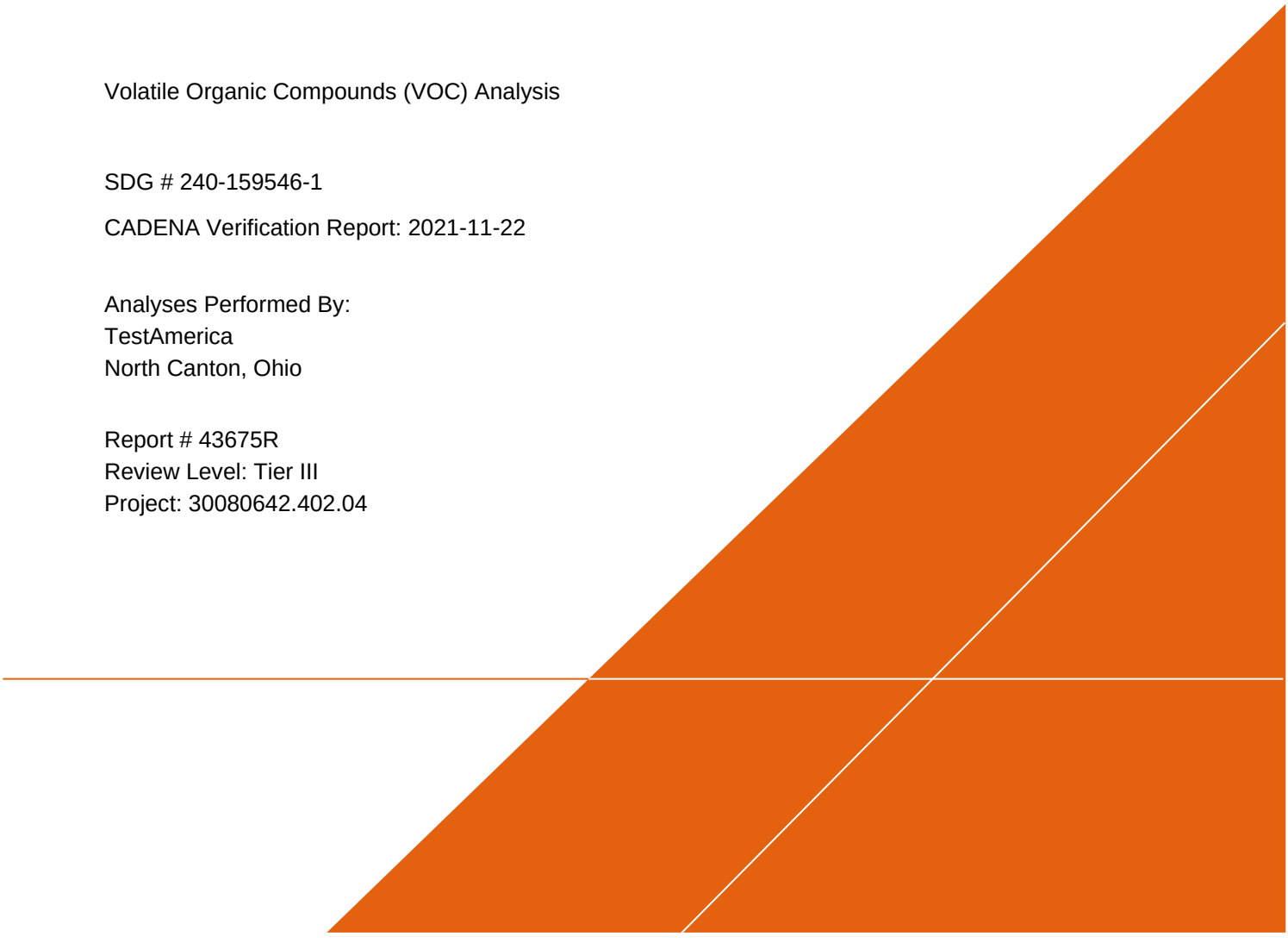
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159546-1

CADENA Verification Report: 2021-11-22

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43675R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159546-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_53	240-159546-1	Water	11/03/21		X	
MW-105S_110321	240-159546-2	Water	11/03/21		X	X
MW-102S_110321	240-159546-3	Water	11/03/21		X	X
MW-102_110321	240-159546-4	Water	11/03/21		X	X
DUP-14	240-159546-5	Water	11/03/21	MW-102_110321	X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Lab file ID	Compound	Criteria
TRIP BLANK_53 MW-105S_110321 MW-102S_110321	Continuous Calibration Verification %D	UXC0795.D	Vinyl chloride	-26.8%
MW-102_110321 DUP-14	Continuous Calibration Verification %D	UXC0827.D	cis-1,2-Dichloroethene	+21.3%
			trans-1,2-Dichloroethene	+26.4%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R

DATA REVIEW

Initial/Continuing	Criteria	Sample Result	Qualification
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result (µg/L)	Duplicate Result (µg/L)	RPD
MW-102_110321 / DUP-14	Vinyl chloride	2.8	2.7	AC

Notes:

AC – Acceptable

The calculated differences between the parent sample and field duplicate were acceptable.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

DATA REVIEW

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 09, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 09, 2021

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: SAM HINKLE	TAT if different from below		Walk-in client
Project Name: Ford LTP Off-Site	COURIER – CHRISTINA WEAVER	10 day ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Lab sampling
Project Number: 30080642.402.04	Method of Shipment/Carrier:			Job/SDG No:
PO # 30080642.402.04	Shipping/Tracking No:			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM				Sample Specific Notes / Special Instructions:
TRIP BLANK_ 53	---	---		X						1					N	G	X	X	X	X	X	X	X				1 Trip Blank
MW-105S_110321	11/3/21	1210		6						6					N	G	X	X	X	X	X	X	X				3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-105S-MS_110321	11/3/21	1210		5						5					N	G	X	X	X	X	X	X	X				ONLY 5 VOAS RUN MS/MSD
MW-105S-MSD_110321	11/3/21	1210		6						6					N	G	X	X	X	X	X	X	X				RUN MS/MSD
MW-102S_110321	11/3/21	1455		6						6					N	G	X	X	X	X	X	X	X				
MW-102_110321	11/3/21	1645		6						6					N	G	X	X	X	X	X	X	X				
DUP-14	11/3/21	—		5						5					N	G	X	X	X	X	X	X	X				ONLY 5 VOAS

240-159546 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be
☐ Return to Client ☑ Disposal By Lab Archive For Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com, Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
SH / [illegible]	ARCADIS	11/3/21 / 1800	NOVI COLD STORAGE	ARCADIS	11/3/21 / 1800
[illegible]	ARCADIS	11/5/21 1435	[illegible]	ETA	11/5/21 / 1435
[illegible]	ETA	11/5/21 1448	M. [illegible]	ETA	11/6/21 8:00

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11/22/2021

Client Sample ID: TRIP BLANK_53

Lab Sample ID: 240-159546-1

Date Collected: 11/03/21 00:00
Matrix: Water
Date Received: 11/06/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 20:51	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 20:51	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 20:51	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 20:51	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 20:51	1
Vinyl chloride	1.0	~~U~~ UJ	1.0	0.45	ug/L			11/13/21 20:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*130*		*62 - 137*		*11/13/21 20:51*	*1*
4-Bromofluorobenzene (Surr)	*67*		*56 - 136*		*11/13/21 20:51*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/13/21 20:51*	*1*
Dibromofluoromethane (Surr)	*115*		*73 - 120*		*11/13/21 20:51*	*1*

Client Sample ID: MW-105S_110321

Lab Sample ID: 240-159546-2

Date Collected: 11/03/21 12:10
Matrix: Water
Date Received: 11/06/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U ~~F1~~	2.0	0.86	ug/L			11/16/21 21:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/16/21 21:00*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 21:13	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 21:13	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 21:13	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 21:13	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 21:13	1
Vinyl chloride	1.0	~~U~~ UJ	1.0	0.45	ug/L			11/13/21 21:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*129*		*62 - 137*		*11/13/21 21:13*	*1*
4-Bromofluorobenzene (Surr)	*67*		*56 - 136*		*11/13/21 21:13*	*1*
Toluene-d8 (Surr)	*88*		*78 - 122*		*11/13/21 21:13*	*1*
Dibromofluoromethane (Surr)	*112*		*73 - 120*		*11/13/21 21:13*	*1*

Client Sample ID: MW-102S_110321

Lab Sample ID: 240-159546-3

Date Collected: 11/03/21 14:55
Matrix: Water
Date Received: 11/06/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/13/21 00:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*11/13/21 00:51*	*1*

Client Sample ID: MW-102S_110321
Lab Sample ID: 240-159546-3
Date Collected: 11/03/21 14:55
Matrix: Water
Date Received: 11/06/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 21:35	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 21:35	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 21:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 21:35	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 21:35	1
Vinyl chloride	1.0	~~U~~ UJ	1.0	0.45	ug/L			11/13/21 21:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*127*		*62 - 137*		*11/13/21 21:35*	*1*
4-Bromofluorobenzene (Surr)	*66*		*56 - 136*		*11/13/21 21:35*	*1*
Toluene-d8 (Surr)	*88*		*78 - 122*		*11/13/21 21:35*	*1*
Dibromofluoromethane (Surr)	*114*		*73 - 120*		*11/13/21 21:35*	*1*

Client Sample ID: MW-102_110321
Lab Sample ID: 240-159546-4
Date Collected: 11/03/21 16:45
Matrix: Water
Date Received: 11/06/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/13/21 01:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*		*11/13/21 01:15*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/15/21 13:39	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/15/21 13:39	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 13:39	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/15/21 13:39	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 13:39	1
Vinyl chloride	**2.8**		1.0	0.45	ug/L			11/15/21 13:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*124*		*62 - 137*		*11/15/21 13:39*	*1*
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*11/15/21 13:39*	*1*
Toluene-d8 (Surr)	*90*		*78 - 122*		*11/15/21 13:39*	*1*
Dibromofluoromethane (Surr)	*107*		*73 - 120*		*11/15/21 13:39*	*1*

Client Sample ID: DUP-14
Lab Sample ID: 240-159546-5
Date Collected: 11/03/21 00:00
Matrix: Water
Date Received: 11/06/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/13/21 01:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*66 - 120*		*11/13/21 01:38*	*1*

Client Sample ID: DUP-14
Date Collected: 11/03/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159546-5
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/15/21 14:01	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/15/21 14:01	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 14:01	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/15/21 14:01	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/15/21 14:01	1
Vinyl chloride	**2.7**		1.0	0.45	ug/L			11/15/21 14:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*125*		*62 - 137*		*11/15/21 14:01*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/15/21 14:01*	*1*
Toluene-d8 (Surr)	*88*		*78 - 122*		*11/15/21 14:01*	*1*
Dibromofluoromethane (Surr)	*108*		*73 - 120*		*11/15/21 14:01*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159418-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/19/2021 1:48:53 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159418-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159418-1

Job ID: 240-159418-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159418-1

Comments
No additional comments.

Receipt
The samples were received on 11/5/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.7º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159418-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159418-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159418-1	TRIP BLANK_33	Water	11/03/21 00:00	11/05/21 08:00
240-159418-2	MW-106S_110321	Water	11/03/21 15:16	11/05/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159418-1

Client Sample ID: TRIP BLANK_33 — Lab Sample ID: 240-159418-1

No Detections.

Client Sample ID: MW-106S_110321 — Lab Sample ID: 240-159418-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159418-1

Client Sample ID: TRIP BLANK_33
Date Collected: 11/03/21 00:00
Date Received: 11/05/21 08:00

Lab Sample ID: 240-159418-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 19:30	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 19:30	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 19:30	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 19:30	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 19:30	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 19:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*11/13/21 19:30*	*1*
4-Bromofluorobenzene (Surr)	*80*		*56 - 136*		*11/13/21 19:30*	*1*
Toluene-d8 (Surr)	*104*		*78 - 122*		*11/13/21 19:30*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/13/21 19:30*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159418-1

Client Sample ID: MW-106S_110321
Date Collected: 11/03/21 15:16
Date Received: 11/05/21 08:00

Lab Sample ID: 240-159418-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U F1	2.0	0.86	ug/L			11/11/21 23:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*		*11/11/21 23:03*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 19:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 19:52	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 19:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 19:52	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 19:52	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 19:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*		*11/13/21 19:52*	*1*
4-Bromofluorobenzene (Surr)	*79*		*56 - 136*		*11/13/21 19:52*	*1*
Toluene-d8 (Surr)	*111*		*78 - 122*		*11/13/21 19:52*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/13/21 19:52*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159418-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159418-1	TRIP BLANK_33	96	80	104	96
240-159418-2	MW-106S_110321	98	79	111	99
240-159418-2 MS	MW-106S-MS_110321	93	87	106	94
240-159418-2 MSD	MW-106S-MSD_110321	90	87	107	91
LCS 240-512817/4	Lab Control Sample	90	89	112	90
MB 240-512817/6	Method Blank	98	81	112	98

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159418-2	MW-106S_110321	81
240-159418-2 MS	MW-106S-MS_110321	82
240-159418-2 MSD	MW-106S-MSD_110321	83
LCS 240-512585/4	Lab Control Sample	81
MB 240-512585/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512817/6
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 13:55	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 13:55	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:55	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 13:55	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:55	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 13:55	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*		*11/13/21 13:55*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/13/21 13:55*	*1*
Toluene-d8 (Surr)	*112*		*78 - 122*		*11/13/21 13:55*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/13/21 13:55*	*1*

Lab Sample ID: LCS 240-512817/4
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.9		ug/L		109	63 - 134
cis-1,2-Dichloroethene	10.0	10.3		ug/L		103	77 - 123
Tetrachloroethene	10.0	11.9		ug/L		119	76 - 123
trans-1,2-Dichloroethene	10.0	10.8		ug/L		108	75 - 124
Trichloroethene	10.0	9.19		ug/L		92	70 - 122
Vinyl chloride	10.0	9.48		ug/L		95	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*89*		*56 - 136*
Toluene-d8 (Surr)	*112*		*78 - 122*
Dibromofluoromethane (Surr)	*90*		*73 - 120*

Lab Sample ID: 240-159418-2 MS
Matrix: Water
Analysis Batch: 512817

Client Sample ID: MW-106S-MS_110321
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	10.3		ug/L		103	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.89		ug/L		99	66 - 128
Tetrachloroethene	1.0	U	10.0	9.53		ug/L		95	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.91		ug/L		99	56 - 136
Trichloroethene	1.0	U	10.0	8.16		ug/L		82	61 - 124
Vinyl chloride	1.0	U	10.0	9.96		ug/L		100	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*106*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159418-2 MS
Matrix: Water
Analysis Batch: 512817

Client Sample ID: MW-106S-MS_110321
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: 240-159418-2 MSD
Matrix: Water
Analysis Batch: 512817

Client Sample ID: MW-106S-MSD_110321
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	10.0		ug/L		100	56 - 135	2	26
cis-1,2-Dichloroethene	1.0	U	10.0	10.1		ug/L		101	66 - 128	2	14
Tetrachloroethene	1.0	U	10.0	10.1		ug/L		101	62 - 131	5	20
trans-1,2-Dichloroethene	1.0	U	10.0	10.1		ug/L		101	56 - 136	2	15
Trichloroethene	1.0	U	10.0	8.61		ug/L		86	61 - 124	5	15
Vinyl chloride	1.0	U	10.0	10.2		ug/L		102	43 - 157	3	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*107*		*78 - 122*
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512585/5
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/11/21 19:04	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/11/21 19:04*	*1*

Lab Sample ID: LCS 240-512585/4
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.86		ug/L		99	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*

Lab Sample ID: 240-159418-2 MS
Matrix: Water
Analysis Batch: 512585

Client Sample ID: MW-106S-MS_110321
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	11.1		ug/L		111	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159418-2 MSD
Matrix: Water
Analysis Batch: 512585

Client Sample ID: MW-106S-MSD_110321
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.2		ug/L		102	51 - 153	8	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159418-1

GC/MS VOA

Analysis Batch: 512585

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159418-2	MW-106S_110321	Total/NA	Water	8260B SIM	
MB 240-512585/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512585/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159418-2 MS	MW-106S-MS_110321	Total/NA	Water	8260B SIM	
240-159418-2 MSD	MW-106S-MSD_110321	Total/NA	Water	8260B SIM	

Analysis Batch: 512817

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159418-1	TRIP BLANK_33	Total/NA	Water	8260B	
240-159418-2	MW-106S_110321	Total/NA	Water	8260B	
MB 240-512817/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512817/4	Lab Control Sample	Total/NA	Water	8260B	
240-159418-2 MS	MW-106S-MS_110321	Total/NA	Water	8260B	
240-159418-2 MSD	MW-106S-MSD_110321	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159418-1

Client Sample ID: TRIP BLANK_33

Lab Sample ID: 240-159418-1

Date Collected: 11/03/21 00:00

Matrix: Water

Date Received: 11/05/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512817	11/13/21 19:30	LEE	TAL CAN

Client Sample ID: MW-106S_110321

Lab Sample ID: 240-159418-2

Date Collected: 11/03/21 15:16

Matrix: Water

Date Received: 11/05/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512817	11/13/21 19:52	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512585	11/11/21 23:03	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159418-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Allyson Hartz	TAT if different from below 10 day ☑ 2 weeks ☐ 3 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM					Sample Specific Notes / Special Instructions:
TRIP BLANK_33	—	—		X						1					N	G	X	X	X	X	X	X	X					1 Trip Blank
MW-1065_110321	11/3/21	1516		X						6					N	G	X	X	X	X	X	X	X					3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-1065-MS_110321	11/3/21	1516		X						6					N	G	X	X	X	X	X	X	X					
MW-1065-MSD_110321	11/3/21	1516		X						6					N	G	X	X	X	X	X	X	X					

240-159418 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Allyson Hartz	Arcadis	11/3/21 1630	Novi cold storage	Arcadis	11/3/21 1630
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	ARCADIS	11/4/21 1040	Jeri Harlen	ETA	11/4/21 1041
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
Jeri Harlen	ETA	11/4/21 1049	M. D.	ETA	11/5/21 8:00

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11/19/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 159418

Client ARCADIS Site Name _____

Cooler unpacked by: Mathew Swna

Cooler Received on 11/5/21 Opened on 11/5/21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other _____

COOLANT: ~~Wet Ice~~ Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF **+0.1** °C) Observed Cooler Temp. 0.6 °C Corrected Cooler Temp. 0.7 °C
   IR GUN #IR-15 (CF **+0.2**°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No	(NA)
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	(No) NA
16. Were a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	(No)

DMF 11-5-21

pH Strip Lot# **HC157842**

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

TB is not logged for SIM due to insufficient Volume.
JJ DMF 11-5-21

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

WI-NC-099

DATA VERIFICATION REPORT

November 19, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159418-1
Sample date: 2021-11-03
Report received by CADENA: 2021-11-19
Initial Data Verification completed by CADENA: 2021-11-19
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, MS/MSD Recovery, MS/MSD RPD, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159418-1

		Sample Name:	TRIP BLANK_33				MW-106S_110321			
		Lab Sample ID:	2401594181				2401594182			
		Sample Date:	11/3/2021				11/3/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

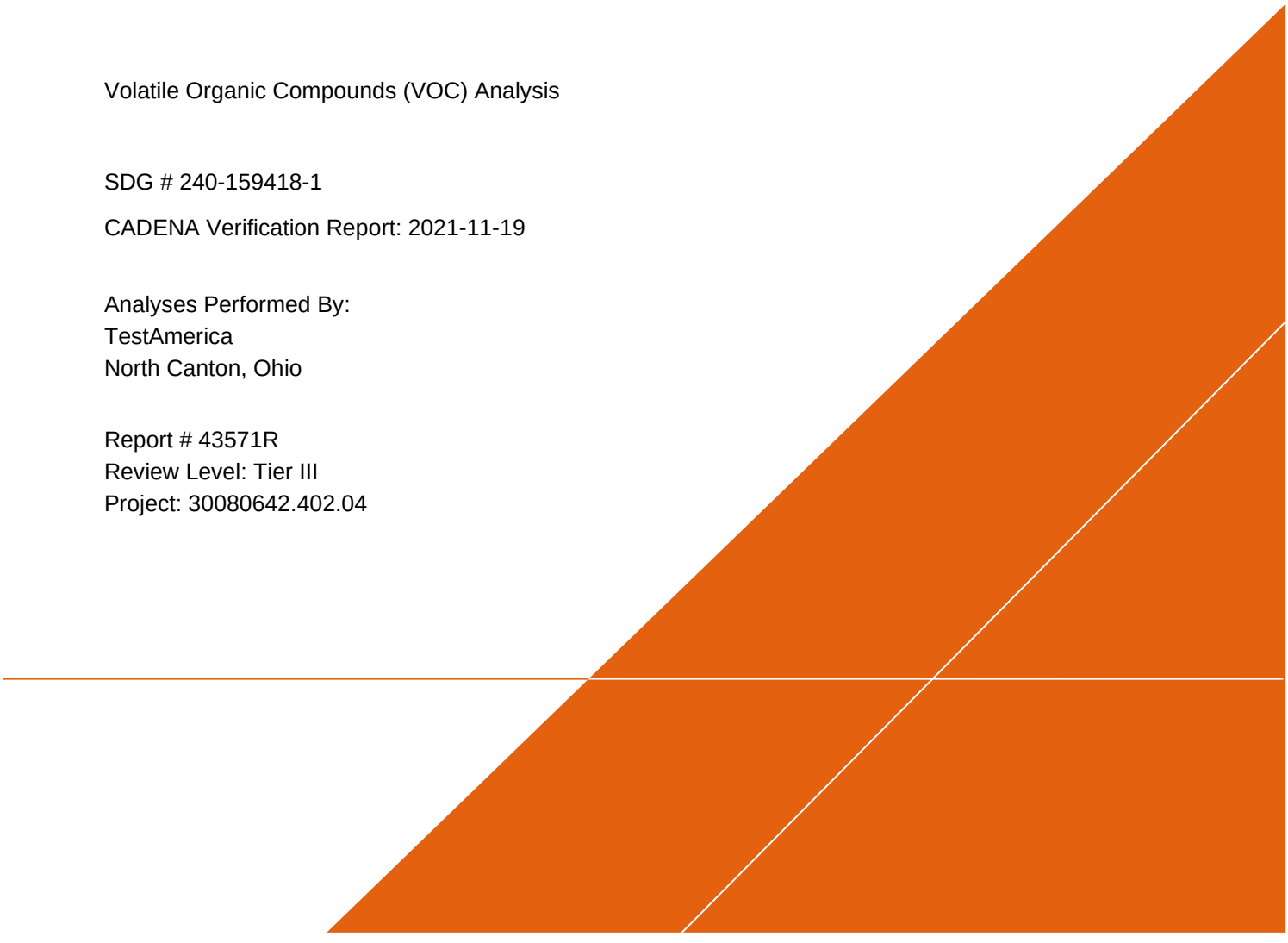
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159418-1

CADENA Verification Report: 2021-11-19

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43571R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159418-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_33	240-159418-1	Water	11/03/21		X	
MW-106S_110321	240-159418-2	Water	11/03/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE:

DATE: December 07, 2021

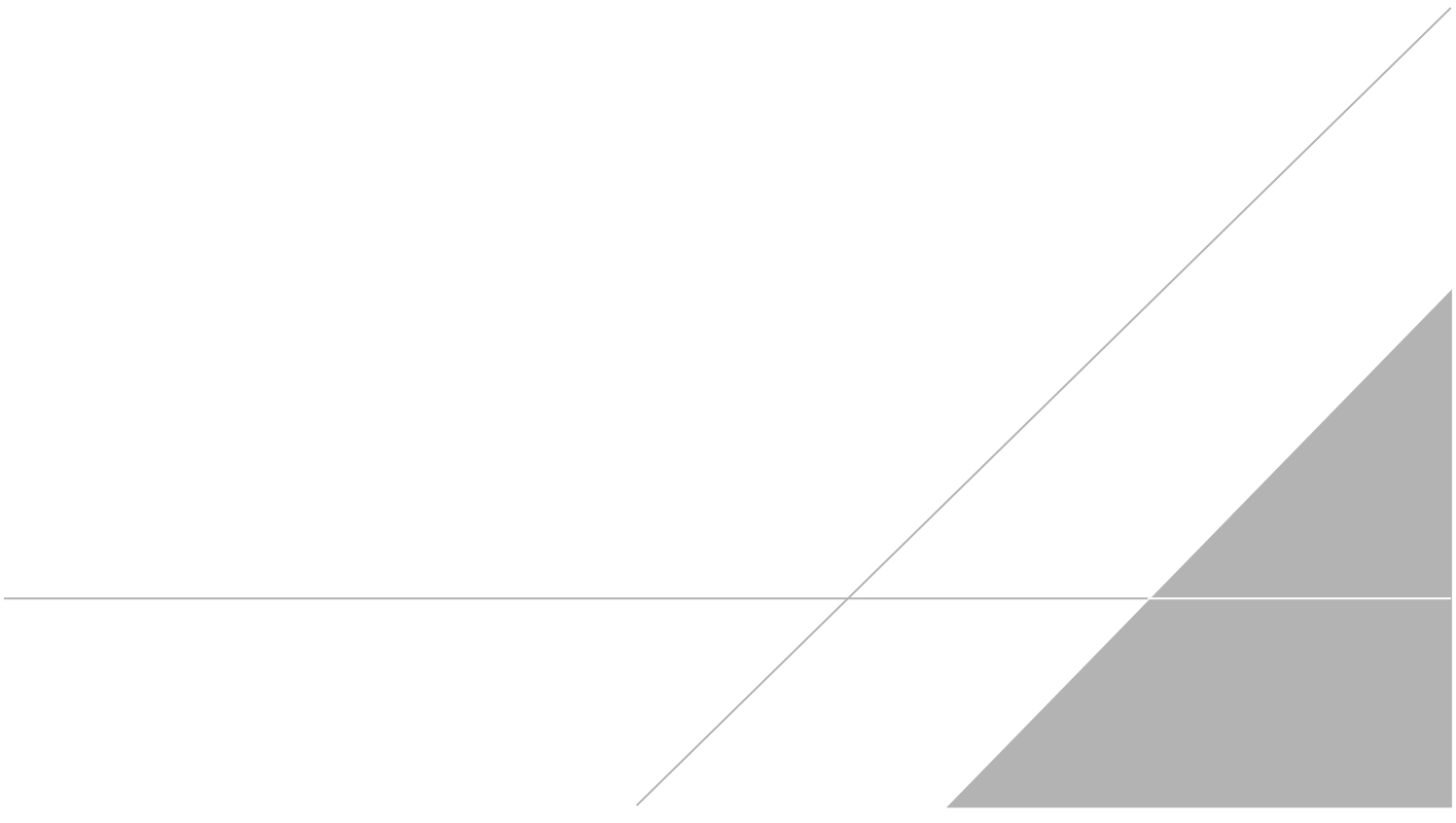
PEER REVIEW: Andrew Korycinski

DATE: December 8, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



MICHIGAN
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Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	DW NPDES RCRA Other	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500		Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377		Sampler Name: Allyson Hartz	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Phone: 248-994-2240		Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site		Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04					
PO # 30080642.402.04					

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_33	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1065_110321	11/3/21	1516		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-1065-MS_110321	11/3/21	1516		X						6					N	G	X	X	X	X	X	X	X	
MW-1065-MSD_110321	11/3/21	1516		X						6					N	G	X	X	X	X	X	X	X	

240-159418 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Allyson Hartz	Arcadis	11/3/21 1630	Novi cold storage	Arcadis	11/3/21 1630
[illegible]	ARCADIS	11/4/21 1040	Jeri Harlen	ETA	11/4/21 1041
Jeri Harlen	ETA	11/4/21 1049	Received in Laboratory by: M. D.	ETA	11/5/21 8:00

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11/19/2021

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159418-1

Client Sample ID: TRIP BLANK_33
Date Collected: 11/03/21 00:00
Date Received: 11/05/21 08:00

Lab Sample ID: 240-159418-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 19:30	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 19:30	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 19:30	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 19:30	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 19:30	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 19:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*11/13/21 19:30*	*1*
4-Bromofluorobenzene (Surr)	*80*		*56 - 136*		*11/13/21 19:30*	*1*
Toluene-d8 (Surr)	*104*		*78 - 122*		*11/13/21 19:30*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/13/21 19:30*	*1*

Client Sample ID: MW-106S_110321

Date Collected: 11/03/21 15:16
Date Received: 11/05/21 08:00

Lab Sample ID: 240-159418-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U ~~F1~~	2.0	0.86	ug/L			11/11/21 23:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*		*11/11/21 23:03*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 19:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 19:52	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 19:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 19:52	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 19:52	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 19:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*		*11/13/21 19:52*	*1*
4-Bromofluorobenzene (Surr)	*79*		*56 - 136*		*11/13/21 19:52*	*1*
Toluene-d8 (Surr)	*111*		*78 - 122*		*11/13/21 19:52*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/13/21 19:52*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159307-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/18/2021 3:19:29 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159307-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159307-1

Job ID: 240-159307-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159307-1

Comments
No additional comments.

Receipt
The samples were received on 11/4/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.0º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159307-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159307-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159307-1	TRIP BLANK_29	Water	11/02/21 00:00	11/04/21 08:00
240-159307-2	MW-142S_110221	Water	11/02/21 12:00	11/04/21 08:00
240-159307-3	MW-132S_110221	Water	11/02/21 14:00	11/04/21 08:00
240-159307-4	MW-131S_110221	Water	11/02/21 15:40	11/04/21 08:00
240-159307-5	DUP-12	Water	11/02/21 00:00	11/04/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159307-1

Client Sample ID: TRIP BLANK_29 — Lab Sample ID: 240-159307-1

No Detections.

Client Sample ID: MW-142S_110221 — Lab Sample ID: 240-159307-2

No Detections.

Client Sample ID: MW-132S_110221 — Lab Sample ID: 240-159307-3

No Detections.

Client Sample ID: MW-131S_110221 — Lab Sample ID: 240-159307-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	0.53	J	1.0	0.45	ug/L	1		8260B	Total/NA

Client Sample ID: DUP-12 — Lab Sample ID: 240-159307-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	0.51	J	1.0	0.45	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159307-1

Client Sample ID: TRIP BLANK_29
Date Collected: 11/02/21 00:00
Date Received: 11/04/21 08:00

Lab Sample ID: 240-159307-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 15:18	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 15:18	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 15:18	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 15:18	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 15:18	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 15:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*122*		*62 - 137*		*11/11/21 15:18*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/11/21 15:18*	*1*
Toluene-d8 (Surr)	*90*		*78 - 122*		*11/11/21 15:18*	*1*
Dibromofluoromethane (Surr)	*106*		*73 - 120*		*11/11/21 15:18*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159307-1

Client Sample ID: MW-142S_110221
Date Collected: 11/02/21 12:00
Date Received: 11/04/21 08:00

Lab Sample ID: 240-159307-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/10/21 22:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/10/21 22:10*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 15:40	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 15:40	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 15:40	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 15:40	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 15:40	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 15:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*121*		*62 - 137*		*11/11/21 15:40*	*1*
4-Bromofluorobenzene (Surr)	*72*		*56 - 136*		*11/11/21 15:40*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/11/21 15:40*	*1*
Dibromofluoromethane (Surr)	*107*		*73 - 120*		*11/11/21 15:40*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159307-1

Client Sample ID: MW-132S_110221
Date Collected: 11/02/21 14:00
Date Received: 11/04/21 08:00

Lab Sample ID: 240-159307-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/10/21 22:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/10/21 22:34*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 16:02	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 16:02	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 16:02	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 16:02	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 16:02	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 16:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*122*		*62 - 137*		*11/11/21 16:02*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/11/21 16:02*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/11/21 16:02*	*1*
Dibromofluoromethane (Surr)	*107*		*73 - 120*		*11/11/21 16:02*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159307-1

Client Sample ID: MW-131S_110221
Date Collected: 11/02/21 15:40
Date Received: 11/04/21 08:00

Lab Sample ID: 240-159307-4
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/10/21 22:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*11/10/21 22:57*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 16:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 16:24	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 16:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 16:24	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 16:24	1
Vinyl chloride	**0.53**	**J**	1.0	0.45	ug/L			11/11/21 16:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*120*		*62 - 137*		*11/11/21 16:24*	*1*
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*11/11/21 16:24*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/11/21 16:24*	*1*
Dibromofluoromethane (Surr)	*107*		*73 - 120*		*11/11/21 16:24*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159307-1

Client Sample ID: DUP-12
Date Collected: 11/02/21 00:00
Date Received: 11/04/21 08:00

Lab Sample ID: 240-159307-5
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/10/21 23:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/10/21 23:21*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 16:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 16:46	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 16:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 16:46	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 16:46	1
Vinyl chloride	**0.51**	**J**	1.0	0.45	ug/L			11/11/21 16:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*123*		*62 - 137*		*11/11/21 16:46*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/11/21 16:46*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/11/21 16:46*	*1*
Dibromofluoromethane (Surr)	*111*		*73 - 120*		*11/11/21 16:46*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159307-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159307-1	TRIP BLANK_29	122	70	90	106
240-159307-2	MW-142S_110221	121	72	89	107
240-159307-3	MW-132S_110221	122	70	89	107
240-159307-4	MW-131S_110221	120	73	89	107
240-159307-5	DUP-12	123	70	89	111
240-159310-H-2 MS	Matrix Spike	103	98	103	94
240-159310-K-2 MSD	Matrix Spike Duplicate	103	96	102	92
LCS 240-512503/4	Lab Control Sample	102	94	101	93
MB 240-512503/7	Method Blank	114	77	90	98

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159307-2	MW-142S_110221	85
240-159307-3	MW-132S_110221	85
240-159307-4	MW-131S_110221	83
240-159307-5	DUP-12	85
240-159310-G-2 MS	Matrix Spike	84
240-159310-M-2 MSD	Matrix Spike Duplicate	84
LCS 240-512369/6	Lab Control Sample	85
MB 240-512369/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512503/7
Matrix: Water
Analysis Batch: 512503

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 13:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 13:07	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 13:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 13:07	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 13:07	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 13:07	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*114*		*62 - 137*		*11/11/21 13:07*	*1*
4-Bromofluorobenzene (Surr)	*77*		*56 - 136*		*11/11/21 13:07*	*1*
Toluene-d8 (Surr)	*90*		*78 - 122*		*11/11/21 13:07*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/11/21 13:07*	*1*

Lab Sample ID: LCS 240-512503/4
Matrix: Water
Analysis Batch: 512503

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.54		ug/L		85	63 - 134
cis-1,2-Dichloroethene	10.0	10.9		ug/L		109	77 - 123
Tetrachloroethene	10.0	9.61		ug/L		96	76 - 123
trans-1,2-Dichloroethene	10.0	11.3		ug/L		113	75 - 124
Trichloroethene	10.0	9.58		ug/L		96	70 - 122
Vinyl chloride	10.0	8.69		ug/L		87	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*
Toluene-d8 (Surr)	*101*		*78 - 122*
Dibromofluoromethane (Surr)	*93*		*73 - 120*

Lab Sample ID: 240-159310-H-2 MS
Matrix: Water
Analysis Batch: 512503

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	8.69		ug/L		87	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.70		ug/L		97	66 - 128
Tetrachloroethene	1.0	U	10.0	8.74		ug/L		87	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	10.1		ug/L		101	56 - 136
Trichloroethene	1.0	U	10.0	8.43		ug/L		84	61 - 124
Vinyl chloride	1.0	U	10.0	8.11		ug/L		81	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*
4-Bromofluorobenzene (Surr)	*98*		*56 - 136*
Toluene-d8 (Surr)	*103*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159310-H-2 MS
Matrix: Water
Analysis Batch: 512503

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: 240-159310-K-2 MSD
Matrix: Water
Analysis Batch: 512503

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	8.78		ug/L		88	56 - 135	1	26
cis-1,2-Dichloroethene	1.0	U	10.0	10.0		ug/L		100	66 - 128	3	14
Tetrachloroethene	1.0	U	10.0	8.65		ug/L		86	62 - 131	1	20
trans-1,2-Dichloroethene	1.0	U	10.0	10.2		ug/L		102	56 - 136	1	15
Trichloroethene	1.0	U	10.0	8.58		ug/L		86	61 - 124	2	15
Vinyl chloride	1.0	U	10.0	8.51		ug/L		85	43 - 157	5	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*
4-Bromofluorobenzene (Surr)	*96*		*56 - 136*
Toluene-d8 (Surr)	*102*		*78 - 122*
Dibromofluoromethane (Surr)	*92*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512369/5
Matrix: Water
Analysis Batch: 512369

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/10/21 19:46	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/10/21 19:46*	*1*

Lab Sample ID: LCS 240-512369/6
Matrix: Water
Analysis Batch: 512369

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.53		ug/L		95	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

Lab Sample ID: 240-159310-G-2 MS
Matrix: Water
Analysis Batch: 512369

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	9.69		ug/L		97	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*

Lab Sample ID: 240-159310-M-2 MSD
Matrix: Water
Analysis Batch: 512369

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.59		ug/L		96	51 - 153	1	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159307-1

GC/MS VOA

Analysis Batch: 512369

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159307-2	MW-142S_110221	Total/NA	Water	8260B SIM	
240-159307-3	MW-132S_110221	Total/NA	Water	8260B SIM	
240-159307-4	MW-131S_110221	Total/NA	Water	8260B SIM	
240-159307-5	DUP-12	Total/NA	Water	8260B SIM	
MB 240-512369/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512369/6	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159310-G-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159310-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 512503

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159307-1	TRIP BLANK_29	Total/NA	Water	8260B	
240-159307-2	MW-142S_110221	Total/NA	Water	8260B	
240-159307-3	MW-132S_110221	Total/NA	Water	8260B	
240-159307-4	MW-131S_110221	Total/NA	Water	8260B	
240-159307-5	DUP-12	Total/NA	Water	8260B	
MB 240-512503/7	Method Blank	Total/NA	Water	8260B	
LCS 240-512503/4	Lab Control Sample	Total/NA	Water	8260B	
240-159310-H-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159310-K-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159307-1

Client Sample ID: TRIP BLANK_29
Lab Sample ID: 240-159307-1
Date Collected: 11/02/21 00:00
Matrix: Water
Date Received: 11/04/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512503	11/11/21 15:18	LEE	TAL CAN

Client Sample ID: MW-142S_110221
Lab Sample ID: 240-159307-2
Date Collected: 11/02/21 12:00
Matrix: Water
Date Received: 11/04/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512503	11/11/21 15:40	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512369	11/10/21 22:10	CS	TAL CAN

Client Sample ID: MW-132S_110221
Lab Sample ID: 240-159307-3
Date Collected: 11/02/21 14:00
Matrix: Water
Date Received: 11/04/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512503	11/11/21 16:02	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512369	11/10/21 22:34	CS	TAL CAN

Client Sample ID: MW-131S_110221
Lab Sample ID: 240-159307-4
Date Collected: 11/02/21 15:40
Matrix: Water
Date Received: 11/04/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512503	11/11/21 16:24	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512369	11/10/21 22:57	CS	TAL CAN

Client Sample ID: DUP-12
Lab Sample ID: 240-159307-5
Date Collected: 11/02/21 00:00
Matrix: Water
Date Received: 11/04/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512503	11/11/21 16:46	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512369	11/10/21 23:21	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159307-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: CHRISTINA WEAVER / SAM HINDLE	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client:
Phone: 248-994-2240	Method of Shipment/Carrier:	10 day		Lab sampling:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_29	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-142S_110221	11/2/21	1200		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-132S_110221	11/2/21	1400		6						6					N	G	X	X	X	X	X	X	X	
MW-131S_110221	11/2/21	1540 (EST)		6						6					N	G	X	X	X	X	X	X	X	
DUP-12	11/2/21	—		6						6					N	G	X	X	X	X	X	X	X	

240-159307 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	ARCADIS	11/2/21 / 1730	NOVI COLD STORAGE	ARCADIS	11/2/21 / 1730
[signature]	ARCADIS	11/3/21 / 0940	[signature]	ETA	11/3/21 946
[signature]	ETA	11/3/21 1006	Received in Laboratory by: [signature]	ETA	11-4-21 8:00

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 59307
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Mandy Block

Cooler Received on 11-4-21 Opened on 11-4-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp 0.9 °C Corrected Cooler Temp. 1.0 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity _____	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# **HC157842**
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

DMF 11/4/21

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

The TB is not logged for SIM due to insufficient volume.
DMF 11-4-21

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

November 18, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159307-1
Sample date: 2021-11-02
Report received by CADENA: 2021-11-18
Initial Data Verification completed by CADENA: 2021-11-18
Number of Samples:5
Sample Matrices:Water and trip blank
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159307-1

		Sample Name:	TRIP BLANK_29				MW-142S_110221				MW-132S_110221				MW-131S_110221				DUP-12			
		Lab Sample ID:	2401593071				2401593072				2401593073				2401593074				2401593075			
		Sample Date:	11/2/2021				11/2/2021				11/2/2021				11/2/2021				11/2/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC																					
OSW-8260B																					
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	0.53	1.0	ug/l	J	0.51	1.0	ug/l	J
OSW-8260BBSim																					
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---	ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

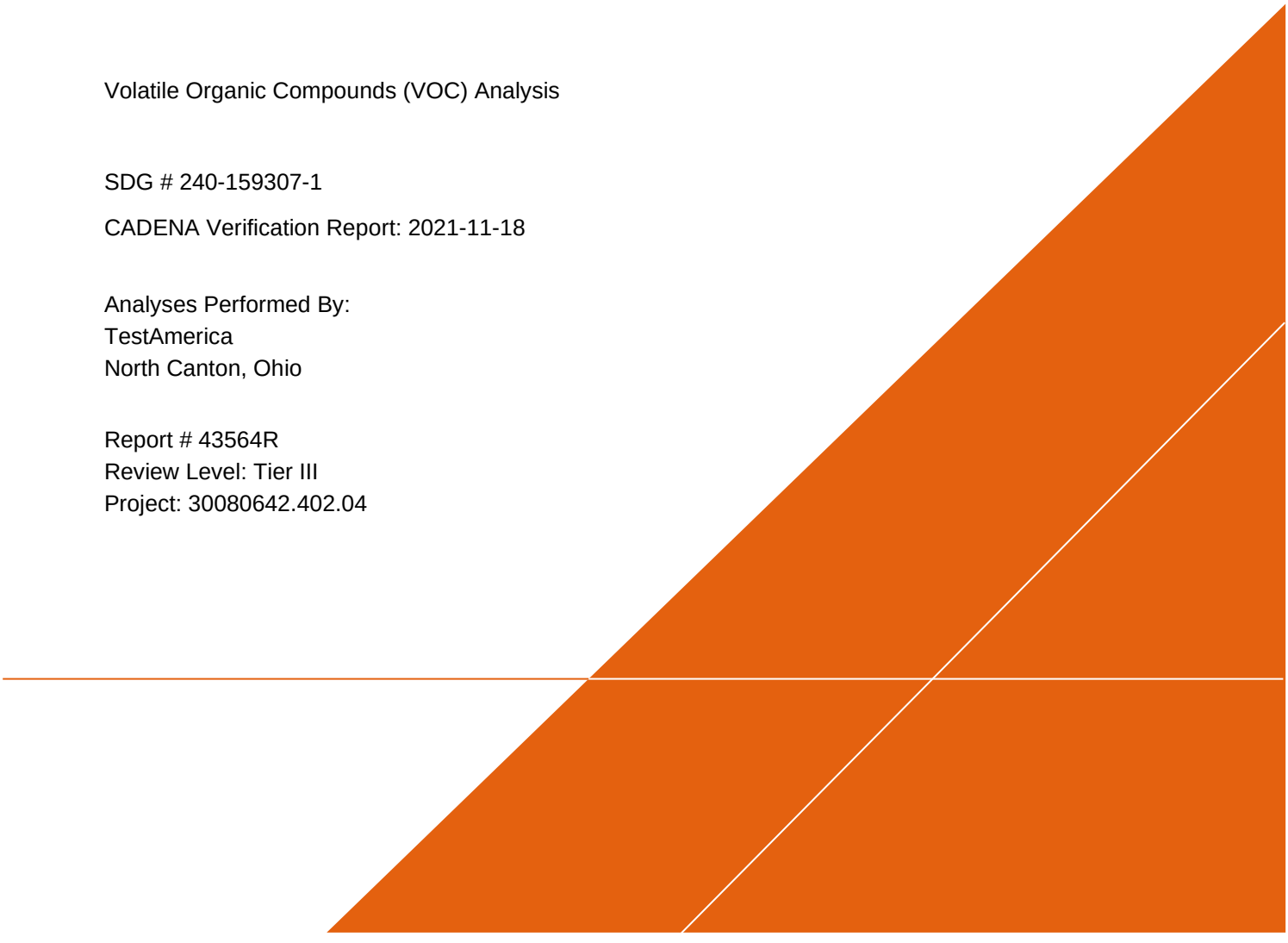
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159307-1

CADENA Verification Report: 2021-11-18

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43564R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159307-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_29	240-159307-1	Water	11/02/2021		X	
MW-142S_110221	240-159307-2	Water	11/02/2021		X	X
MW-132S_110221	240-159307-3	Water	11/02/2021		X	X
MW-131S_110221	240-159307-4	Water	11/02/2021		X	X
DUP-12	240-159307-5	Water	11/02/2021	MW-131S_110221	X	X

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even

if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Compound	Criteria
TRIP BLANK_29 MW-142S_110221 MW-132S_110221 MW-131S_110221 DUP-12	Continuous Calibration Verification %D	trans-1,2-Dichloroethene	+21.5%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result (µg/L)	Duplicate Result (µg/L)	RPD
MW-131S_110221 / DUP-12	Vinyl Chloride	0.53 J	0.51 J	AC
	1,4-Dioxane	2.0 U	2.0 U	AC

Notes:

AC – Acceptable

The calculated differences between the parent sample and field duplicate were acceptable.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

DATA REVIEW

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE:

DATE: December 07, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 7, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	DW / NPDES / RCRA / Other	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500		Email: kristoffer.hinskey@arcadis.com			
City/State/Zip: Novi, MI, 48377		Sampler Name: CHRISTINA WEAVER / SAM HINDLE	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240		Method of Shipment/Carrier:	TAT if different from below: 10 day; 3 weeks / 2 weeks / 1 week / 2 days / 1 day		Walk-in client
Project Name: Ford LTP Off-Site		Shipping/Tracking No:			Lab sampling
Project Number: 30080642.402.04					Job/SDG No:
PO # 30080642.402.04					

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn/Ac NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_29	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-142S_110221	11/2/21	1200		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-132S_110221	11/2/21	1400		6						6					N	G	X	X	X	X	X	X	X	
MW-131S_110221	11/2/21	1540 (EST)		6						6					N	G	X	X	X	X	X	X	X	
DUP-12	11/2/21	—		6						6					N	G	X	X	X	X	X	X	X	

240-159307 Chain of Custody

Possible Hazard Identification: Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / Disposal By Lab / Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Christina Weaver	ARCADIS	11/2/21 / 1730	Novi Cold Storage	ARCADIS	11/2/21 / 1730
Christina Weaver	ARCADIS	11/3/21 / 0940	Jeri Hall	ETA	11/3/21 946
Jeri Hall	ETA	11/3/21 1006	Received in Laboratory by: Mandolyn Block	ETA	11-4-21 8:00

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Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159307-1

Client Sample ID: TRIP BLANK_29
Date Collected: 11/02/21 00:00
Date Received: 11/04/21 08:00

Lab Sample ID: 240-159307-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 15:18	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 15:18	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 15:18	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 15:18	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 15:18	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 15:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*122*		*62 - 137*		*11/11/21 15:18*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/11/21 15:18*	*1*
Toluene-d8 (Surr)	*90*		*78 - 122*		*11/11/21 15:18*	*1*
Dibromofluoromethane (Surr)	*106*		*73 - 120*		*11/11/21 15:18*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159307-1

Client Sample ID: MW-142S_110221
Date Collected: 11/02/21 12:00
Date Received: 11/04/21 08:00

Lab Sample ID: 240-159307-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/10/21 22:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/10/21 22:10*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 15:40	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 15:40	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 15:40	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 15:40	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 15:40	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 15:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*121*		*62 - 137*		*11/11/21 15:40*	*1*
4-Bromofluorobenzene (Surr)	*72*		*56 - 136*		*11/11/21 15:40*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/11/21 15:40*	*1*
Dibromofluoromethane (Surr)	*107*		*73 - 120*		*11/11/21 15:40*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159307-1

Client Sample ID: MW-132S_110221
Date Collected: 11/02/21 14:00
Date Received: 11/04/21 08:00

Lab Sample ID: 240-159307-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/10/21 22:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/10/21 22:34*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 16:02	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 16:02	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 16:02	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 16:02	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 16:02	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 16:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*122*		*62 - 137*		*11/11/21 16:02*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/11/21 16:02*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/11/21 16:02*	*1*
Dibromofluoromethane (Surr)	*107*		*73 - 120*		*11/11/21 16:02*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159307-1

Client Sample ID: MW-131S_110221
Date Collected: 11/02/21 15:40
Date Received: 11/04/21 08:00

Lab Sample ID: 240-159307-4
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/10/21 22:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*11/10/21 22:57*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 16:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 16:24	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 16:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 16:24	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 16:24	1
Vinyl chloride	**0.53**	**J**	1.0	0.45	ug/L			11/11/21 16:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*120*		*62 - 137*		*11/11/21 16:24*	*1*
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*11/11/21 16:24*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/11/21 16:24*	*1*
Dibromofluoromethane (Surr)	*107*		*73 - 120*		*11/11/21 16:24*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159307-1

Client Sample ID: DUP-12
Date Collected: 11/02/21 00:00
Date Received: 11/04/21 08:00

Lab Sample ID: 240-159307-5
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/10/21 23:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/10/21 23:21*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 16:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 16:46	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 16:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 16:46	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 16:46	1
Vinyl chloride	**0.51**	**J**	1.0	0.45	ug/L			11/11/21 16:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*123*		*62 - 137*		*11/11/21 16:46*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/11/21 16:46*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/11/21 16:46*	*1*
Dibromofluoromethane (Surr)	*111*		*73 - 120*		*11/11/21 16:46*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159625-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/23/2021 9:17:13 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159625-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159625-1

Job ID: 240-159625-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159625-1

Comments
No additional comments.

Receipt
The samples were received on 11/9/2021 10:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 3.7º C and 3.8º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159625-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159625-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159625-1	TRIP BLANK_77	Water	11/05/21 00:00	11/09/21 10:00
240-159625-2	MW-133S_110521	Water	11/05/21 13:40	11/09/21 10:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159625-1

Client Sample ID: TRIP BLANK_77 — Lab Sample ID: 240-159625-1

No Detections.

Client Sample ID: MW-133S_110521 — Lab Sample ID: 240-159625-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159625-1

Client Sample ID: TRIP BLANK_77
Date Collected: 11/05/21 00:00
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159625-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 17:39	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 17:39	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 17:39	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 17:39	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 17:39	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 17:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*62 - 137*		*11/16/21 17:39*	*1*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*		*11/16/21 17:39*	*1*
Toluene-d8 (Surr)	*92*		*78 - 122*		*11/16/21 17:39*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/16/21 17:39*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159625-1

Client Sample ID: MW-133S_110521
Date Collected: 11/05/21 13:40
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159625-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/16/21 23:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/16/21 23:47*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 21:12	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 21:12	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 21:12	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 21:12	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 21:12	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 21:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*		*11/16/21 21:12*	*1*
4-Bromofluorobenzene (Surr)	*92*		*56 - 136*		*11/16/21 21:12*	*1*
Toluene-d8 (Surr)	*101*		*78 - 122*		*11/16/21 21:12*	*1*
Dibromofluoromethane (Surr)	*113*		*73 - 120*		*11/16/21 21:12*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159625-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159625-1	TRIP BLANK_77	88	85	92	102
240-159625-2	MW-133S_110521	103	92	101	113
240-159636-F-2 MS	Matrix Spike	93	93	102	105
240-159636-G-2 MSD	Matrix Spike Duplicate	93	94	103	105
LCS 240-513208/5	Lab Control Sample	86	91	100	101
MB 240-513208/8	Method Blank	91	87	98	108

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159546-G-2 MS	Matrix Spike	82
240-159546-M-2 MSD	Matrix Spike Duplicate	85
240-159625-2	MW-133S_110521	85
LCS 240-513286/4	Lab Control Sample	82
MB 240-513286/5	Method Blank	85

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513208/8
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 14:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 14:06	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 14:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 14:06	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 14:06	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 14:06	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*62 - 137*		*11/16/21 14:06*	*1*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*		*11/16/21 14:06*	*1*
Toluene-d8 (Surr)	*98*		*78 - 122*		*11/16/21 14:06*	*1*
Dibromofluoromethane (Surr)	*108*		*73 - 120*		*11/16/21 14:06*	*1*

Lab Sample ID: LCS 240-513208/5
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	28.3		ug/L		113	63 - 134
cis-1,2-Dichloroethene	25.0	26.1		ug/L		104	77 - 123
Tetrachloroethene	25.0	29.3		ug/L		117	76 - 123
trans-1,2-Dichloroethene	25.0	27.4		ug/L		110	75 - 124
Trichloroethene	25.0	27.4		ug/L		110	70 - 122
Vinyl chloride	25.0	24.0		ug/L		96	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*
4-Bromofluorobenzene (Surr)	*91*		*56 - 136*
Toluene-d8 (Surr)	*100*		*78 - 122*
Dibromofluoromethane (Surr)	*101*		*73 - 120*

Lab Sample ID: 240-159636-F-2 MS
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	25.0	25.8		ug/L		103	56 - 135
cis-1,2-Dichloroethene	1.0	U	25.0	24.8		ug/L		99	66 - 128
Tetrachloroethene	1.0	U	25.0	28.9		ug/L		116	62 - 131
trans-1,2-Dichloroethene	1.0	U	25.0	25.3		ug/L		101	56 - 136
Trichloroethene	1.0	U	25.0	25.4		ug/L		101	61 - 124
Vinyl chloride	1.0	U	25.0	22.2		ug/L		89	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*93*		*56 - 136*
Toluene-d8 (Surr)	*102*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159636-F-2 MS
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*105*		*73 - 120*

Lab Sample ID: 240-159636-G-2 MSD
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	25.0	25.9		ug/L		104	56 - 135	0	26
cis-1,2-Dichloroethene	1.0	U	25.0	25.0		ug/L		100	66 - 128	1	14
Tetrachloroethene	1.0	U	25.0	29.5		ug/L		118	62 - 131	2	20
trans-1,2-Dichloroethene	1.0	U	25.0	25.1		ug/L		100	56 - 136	1	15
Trichloroethene	1.0	U	25.0	25.3		ug/L		101	61 - 124	0	15
Vinyl chloride	1.0	U	25.0	22.3		ug/L		89	43 - 157	1	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*
Toluene-d8 (Surr)	*103*		*78 - 122*
Dibromofluoromethane (Surr)	*105*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513286/5
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/16/21 19:44	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/16/21 19:44*	*1*

Lab Sample ID: LCS 240-513286/4
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.78		ug/L		98	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159546-G-2 MS
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	11.0		ug/L		110	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159546-M-2 MSD
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.83		ug/L		98	51 - 153	11	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159625-1

GC/MS VOA

Analysis Batch: 513208

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159625-1	TRIP BLANK_77	Total/NA	Water	8260B	
240-159625-2	MW-133S_110521	Total/NA	Water	8260B	
MB 240-513208/8	Method Blank	Total/NA	Water	8260B	
LCS 240-513208/5	Lab Control Sample	Total/NA	Water	8260B	
240-159636-F-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159636-G-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 513286

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159625-2	MW-133S_110521	Total/NA	Water	8260B SIM	
MB 240-513286/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513286/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159546-G-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159546-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159625-1

Client Sample ID: TRIP BLANK_77

Lab Sample ID: 240-159625-1

Date Collected: 11/05/21 00:00

Matrix: Water

Date Received: 11/09/21 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513208	11/16/21 17:39	SAM	TAL CAN

Client Sample ID: MW-133S_110521

Lab Sample ID: 240-159625-2

Date Collected: 11/05/21 13:40

Matrix: Water

Date Received: 11/09/21 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513208	11/16/21 21:12	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	513286	11/16/21 23:47	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159625-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

MICHIGAN 190 TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No: 1 of 1 COCs
Phone: 248-994-2240	Sampler Name: Samantha Hinkle COURIER: CHRISTINA WEAVER	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day	For lab use only: Walk-in client; Lab sampling; Job/SDG No:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30080642.402.04	Shipping/Tracking No:		
PO # 30080642.402.04			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac / NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_77	---	---		X						1							X	X	X	X	X	X	X (SH)	1 Trip Blank
MW-(SH)1335-110521	11/5/21	13:40		6						6							X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159625 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
SH	Arcadis	11/5/21 16:30	NOVI COLD STORAGE	ARCADIS	11/5/21 / 16:30
	ARCADIS	11/8/21 / 1200		ETA	11/8/21 / 1200
	ETA	11/8/21	Received in Laboratory by:	ETA	11-9-21 1000

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11/23/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 159625
Canton Facility

Client ARCADIS Site Name _____ Cooler unpacked by: Tammy Dayer

Cooler Received on 11-9-21 Opened on 11-9-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 2 Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
   -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? Yes No
11. Sufficient quantity received to perform indicated analyses? Yes No
12. Are these work share samples and all listed on the COC? Yes No
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# **HC157842**
14. Were VOAs on the COC? Yes No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 60358 Yes No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page Samples processed by:

The TB is not logged ~~due to insufficient volume~~ for SIM per corrected COC [initials] 11/11/21 ~~[initials] 11-9-21~~

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

WI-NC-099

Login # : 159625

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form				
Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
(TA) Client Box Other	(IR-14) IR-15	3.6	3.7	(Wet Ice) Blue Ice Dry Ice Water None
(TA) Client Box Other	(IR-14) IR-15	3.7	3.8	(Wet Ice) Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice

DATA VERIFICATION REPORT

November 23, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159625-1
Sample date: 2021-11-05
Report received by CADENA: 2021-11-23
Initial Data Verification completed by CADENA: 2021-11-23
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159625-1

		Sample Name:	TRIP BLANK_77				MW-133S_110521			
		Lab Sample ID:	2401596251				2401596252			
		Sample Date:	11/5/2021				11/5/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

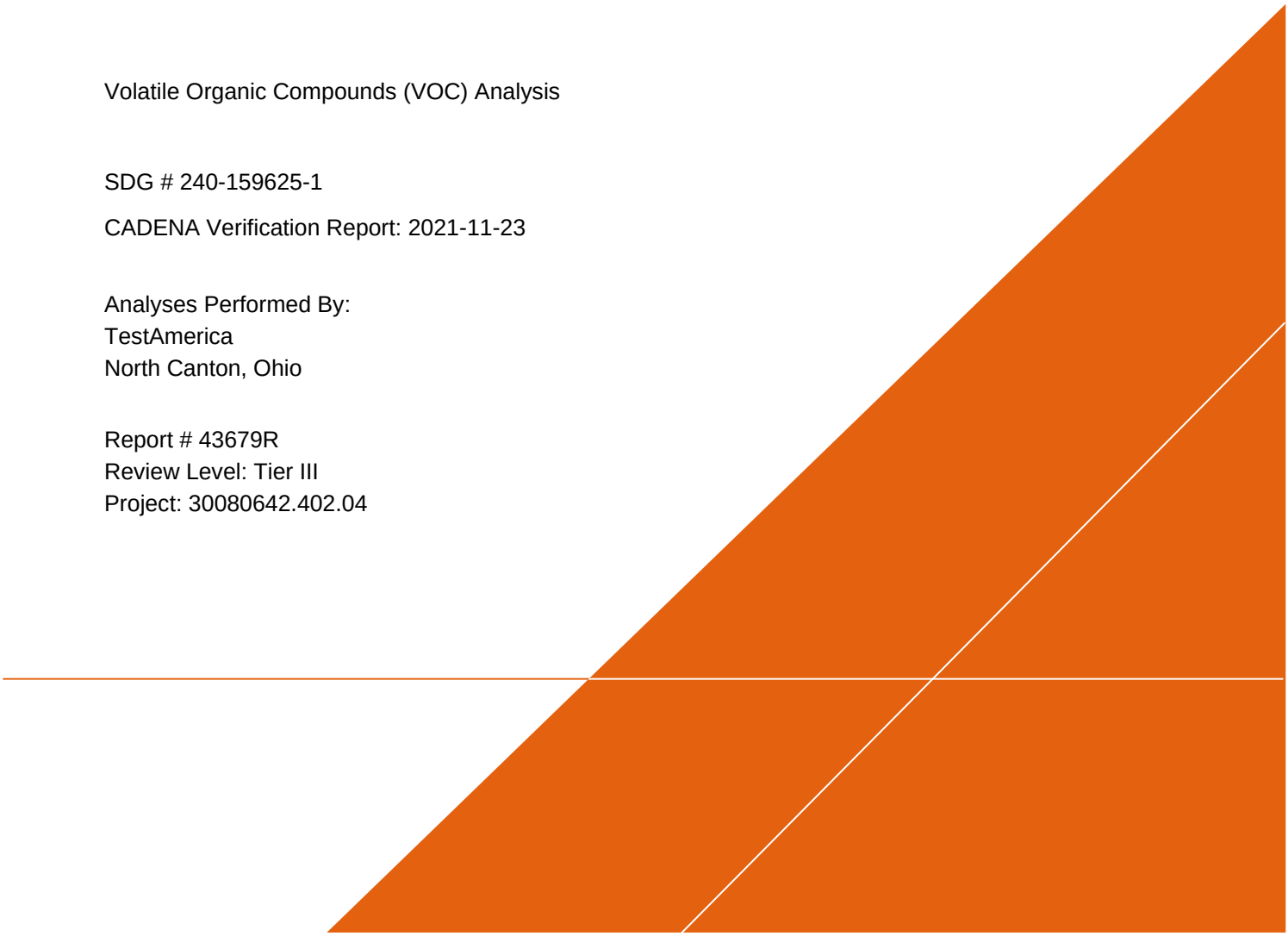
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159625-1

CADENA Verification Report: 2021-11-23

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43679R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159625-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_77	240-159625-1	Water	11/05/21		X	
MW-133S_110521	240-159625-2	Water	11/05/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 10, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 14, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190 TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Samantha Hindle		
Project Name: Ford LTP Off-Site	COURIER: CHRISTINA WEAVER		
Project Number: 30080642.402.04	Method of Shipment/Carrier:		
PO # 30080642.402.04	Shipping/Tracking No:		

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below: 10 day ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_77	---	---		X						1							X	X	X	X	X	X	~~X~~ CW	1 Trip Blank
MW-~~[illegible]~~ SH 1335-110521	11/5/21	13:40		6						6							X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159625 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
SH / [signature]	Arcadis	11/5/21 16:30	NOVI COLD STORAGE	ARCADIS	11/5/21 / 16:30
[signature]	ARCADIS	11/8/21 / 1200	[signature]	ETA	11/8/21 / 1200
[signature]	ETA	11/8/21	Received in Laboratory by: [signature]	ETA	11-9-21 1000

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Client Sample ID: TRIP BLANK_77
Lab Sample ID: 240-159625-1
Date Collected: 11/05/21 00:00
Matrix: Water
Date Received: 11/09/21 10:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 17:39	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 17:39	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 17:39	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 17:39	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 17:39	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 17:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*62 - 137*		*11/16/21 17:39*	*1*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*		*11/16/21 17:39*	*1*
Toluene-d8 (Surr)	*92*		*78 - 122*		*11/16/21 17:39*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/16/21 17:39*	*1*

Client Sample ID: MW-133S_110521
Lab Sample ID: 240-159625-2
Date Collected: 11/05/21 13:40
Matrix: Water
Date Received: 11/09/21 10:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/16/21 23:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/16/21 23:47*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 21:12	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 21:12	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 21:12	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 21:12	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 21:12	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 21:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*		*11/16/21 21:12*	*1*
4-Bromofluorobenzene (Surr)	*92*		*56 - 136*		*11/16/21 21:12*	*1*
Toluene-d8 (Surr)	*101*		*78 - 122*		*11/16/21 21:12*	*1*
Dibromofluoromethane (Surr)	*113*		*73 - 120*		*11/16/21 21:12*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159631-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/23/2021 10:31:05 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159631-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159631-1

Job ID: 240-159631-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159631-1

Comments
No additional comments.

Receipt
The samples were received on 11/9/2021 10:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 3.7º C and 3.8º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159631-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159631-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159631-1	TRIP BLANK_57	Water	11/05/21 00:00	11/09/21 10:00
240-159631-2	MW-135S_110521	Water	11/05/21 11:00	11/09/21 10:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159631-1

Client Sample ID: TRIP BLANK_57 — Lab Sample ID: 240-159631-1

No Detections.

Client Sample ID: MW-135S_110521 — Lab Sample ID: 240-159631-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159631-1

Client Sample ID: TRIP BLANK_57
Date Collected: 11/05/21 00:00
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159631-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 20:56	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 20:56	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 20:56	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 20:56	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 20:56	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 20:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*62 - 137*		*11/16/21 20:56*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/16/21 20:56*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/16/21 20:56*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/16/21 20:56*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159631-1

Client Sample ID: MW-135S_110521
Date Collected: 11/05/21 11:00
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159631-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 00:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*11/17/21 00:35*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 22:12	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 22:12	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 22:12	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 22:12	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 22:12	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 22:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*11/16/21 22:12*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/16/21 22:12*	*1*
Toluene-d8 (Surr)	*90*		*78 - 122*		*11/16/21 22:12*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/16/21 22:12*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159631-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159556-A-21 MS	Matrix Spike	88	90	93	97
240-159556-A-21 MSD	Matrix Spike Duplicate	86	90	92	94
240-159631-1	TRIP BLANK_57	94	82	89	101
240-159631-2	MW-135S_110521	96	81	90	101
LCS 240-513207/5	Lab Control Sample	86	91	94	94
MB 240-513207/8	Method Blank	94	85	91	102

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159546-G-2 MS	Matrix Spike	82
240-159546-M-2 MSD	Matrix Spike Duplicate	85
240-159631-2	MW-135S_110521	83
LCS 240-513286/4	Lab Control Sample	82
MB 240-513286/5	Method Blank	85

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513207/8
Matrix: Water
Analysis Batch: 513207

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 14:40	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 14:40	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 14:40	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 14:40	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 14:40	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 14:40	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*62 - 137*		*11/16/21 14:40*	*1*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*		*11/16/21 14:40*	*1*
Toluene-d8 (Surr)	*91*		*78 - 122*		*11/16/21 14:40*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/16/21 14:40*	*1*

Lab Sample ID: LCS 240-513207/5
Matrix: Water
Analysis Batch: 513207

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	26.9		ug/L		107	63 - 134
cis-1,2-Dichloroethene	25.0	24.4		ug/L		98	77 - 123
Tetrachloroethene	25.0	27.1		ug/L		108	76 - 123
trans-1,2-Dichloroethene	25.0	25.3		ug/L		101	75 - 124
Trichloroethene	25.0	26.3		ug/L		105	70 - 122
Vinyl chloride	25.0	20.2		ug/L		81	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*
4-Bromofluorobenzene (Surr)	*91*		*56 - 136*
Toluene-d8 (Surr)	*94*		*78 - 122*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: 240-159556-A-21 MS
Matrix: Water
Analysis Batch: 513207

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	100	U	2500	2520		ug/L		101	56 - 135
cis-1,2-Dichloroethene	100	U	2500	2460		ug/L		98	66 - 128
Tetrachloroethene	3100		2500	5610		ug/L		100	62 - 131
trans-1,2-Dichloroethene	100	U	2500	2480		ug/L		99	56 - 136
Trichloroethene	83	J	2500	2530		ug/L		98	61 - 124
Vinyl chloride	100	U	2500	1980		ug/L		79	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*62 - 137*
4-Bromofluorobenzene (Surr)	*90*		*56 - 136*
Toluene-d8 (Surr)	*93*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159556-A-21 MS
Matrix: Water
Analysis Batch: 513207

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*97*		*73 - 120*

Lab Sample ID: 240-159556-A-21 MSD
Matrix: Water
Analysis Batch: 513207

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	100	U	2500	2510		ug/L		100	56 - 135	0	26
cis-1,2-Dichloroethene	100	U	2500	2470		ug/L		99	66 - 128	1	14
Tetrachloroethene	3100		2500	5590		ug/L		99	62 - 131	0	20
trans-1,2-Dichloroethene	100	U	2500	2480		ug/L		99	56 - 136	0	15
Trichloroethene	83	J	2500	2610		ug/L		101	61 - 124	3	15
Vinyl chloride	100	U	2500	1920		ug/L		77	43 - 157	3	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*
4-Bromofluorobenzene (Surr)	*90*		*56 - 136*
Toluene-d8 (Surr)	*92*		*78 - 122*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513286/5
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/16/21 19:44	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/16/21 19:44*	*1*

Lab Sample ID: LCS 240-513286/4
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.78		ug/L		98	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159546-G-2 MS
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	11.0		ug/L		110	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159546-M-2 MSD
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.83		ug/L		98	51 - 153	11	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159631-1

GC/MS VOA

Analysis Batch: 513207

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159631-1	TRIP BLANK_57	Total/NA	Water	8260B	
240-159631-2	MW-135S_110521	Total/NA	Water	8260B	
MB 240-513207/8	Method Blank	Total/NA	Water	8260B	
LCS 240-513207/5	Lab Control Sample	Total/NA	Water	8260B	
240-159556-A-21 MS	Matrix Spike	Total/NA	Water	8260B	
240-159556-A-21 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 513286

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159631-2	MW-135S_110521	Total/NA	Water	8260B SIM	
MB 240-513286/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513286/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159546-G-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159546-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159631-1

Client Sample ID: TRIP BLANK_57

Lab Sample ID: 240-159631-1

Date Collected: 11/05/21 00:00

Matrix: Water

Date Received: 11/09/21 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513207	11/16/21 20:56	SAM	TAL CAN

Client Sample ID: MW-135S_110521

Lab Sample ID: 240-159631-2

Date Collected: 11/05/21 11:00

Matrix: Water

Date Received: 11/09/21 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513207	11/16/21 22:12	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	513286	11/17/21 00:35	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159631-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

CHIGAN 190 TestAmerica

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	For lab use only
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		Walk-in client
Phone: 248-994-2240	Sampler Name: Allyson Hartz	TAT if different from below: 10 day; 3 weeks, ✓ 2 weeks, 1 week, 2 days, 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30080642.402.04	Shipping/Tracking No:			
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_57	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1355-110521	11/5/21	1100		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159631 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; ✓ Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: Allyson Hartz	Arcadis	11/5/21 1215	Received by: Navy cold storage	Arcadis	11/5/21 1215
Relinquished by: [illegible]	Arcadis	11/8/21 1200	Received by: [illegible]	ETA	11/8/21 1200
Relinquished by: [illegible]	ETA	11/8/21	Received in Laboratory by: [illegible]	ETA	11-9-21 [illegible]

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11/23/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159631**
Canton Facility

Client ARCADIS Site Name _____ Cooler unpacked by: Tammy Dyer

Cooler Received on 11-9-21 Opened on 11-9-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # LA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 2	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?	Yes	No
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC157842
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 60358	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

The TB is not logged for SIM due to insufficient Volume, per corrected COC. DMF 11/11/21 DMF 11/9/21

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

Login # : 159631

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form				
Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
(TA) Client Box Other	(IR-14) IR-15	3.6	3.7	(Wet Ice) Blue Ice Dry Ice Water None
(TA) Client Box Other	(IR-14) IR-15	3.7	3.8	(Wet Ice) Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
☐ See Temperature Excursion Form				

WI-NC-099 Cooler Receipt Form Page 2 – Multiple Coolers

DATA VERIFICATION REPORT

November 23, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159631-1
Sample date: 2021-11-05
Report received by CADENA: 2021-11-23
Initial Data Verification completed by CADENA: 2021-11-23
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159631-1

		Sample Name:	TRIP BLANK_57				MW-135S_110521			
		Lab Sample ID:	2401596311				2401596312			
		Sample Date:	11/5/2021				11/5/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

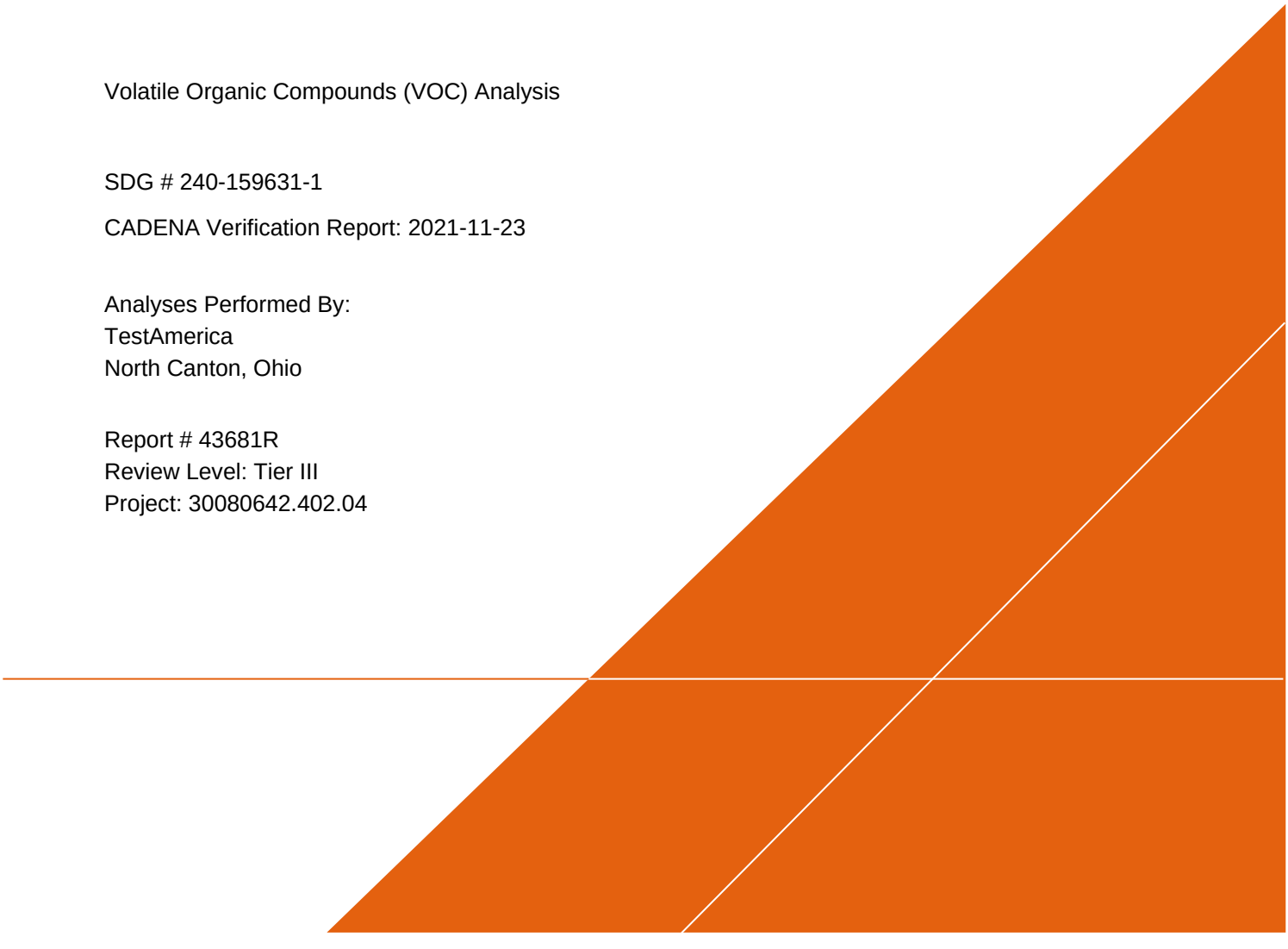
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159631-1

CADENA Verification Report: 2021-11-23

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43681R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159631-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_57	240-159631-1	Water	11/05/21		X	
MW-135S_110521	240-159631-2	Water	11/05/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 10, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 14, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

CHIGAN 190

TestAmerica

TestAmerica Laboratories, Inc.

Regulatory program: DW NPDES RCRA Other

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Allyson Hartz	TAT if different from below: 10 day; 3 weeks, ✓ 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_57	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1355-110521	11/5/21	1100		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159631 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; ✓ Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company:	Date/Time:		Company:	Date/Time:
Relinquished by: Allyson Hartz	Arcadis	11/5/21 1215	Received by: Nav cold storage	Arcadis	11/5/21 1215
Relinquished by: [illegible]	ARCADIS	11/8/21 1200	Received by: [illegible]	ETA	11/8/21 1200
Relinquished by: [illegible]	ETA	11/8/21	Received in Laboratory by: [illegible]	ETA	11-9-21 1000

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Client Sample ID: TRIP BLANK_57
Lab Sample ID: 240-159631-1
Date Collected: 11/05/21 00:00
Matrix: Water
Date Received: 11/09/21 10:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 20:56	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 20:56	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 20:56	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 20:56	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 20:56	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 20:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*62 - 137*		*11/16/21 20:56*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/16/21 20:56*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/16/21 20:56*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/16/21 20:56*	*1*

Client Sample ID: MW-135S_110521
Lab Sample ID: 240-159631-2
Date Collected: 11/05/21 11:00
Matrix: Water
Date Received: 11/09/21 10:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 00:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*11/17/21 00:35*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 22:12	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 22:12	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 22:12	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 22:12	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 22:12	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 22:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*11/16/21 22:12*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/16/21 22:12*	*1*
Toluene-d8 (Surr)	*90*		*78 - 122*		*11/16/21 22:12*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/16/21 22:12*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159834-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/26/2021 7:57:28 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

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Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159834-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159834-1

Job ID: 240-159834-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159834-1

Comments
No additional comments.

Receipt
The samples were received on 11/11/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 4.6º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159834-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159834-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159834-1	TRIP BLANK_92	Water	11/09/21 00:00	11/11/21 08:00
240-159834-2	MW-136S_110921	Water	11/09/21 10:28	11/11/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159834-1

Client Sample ID: TRIP BLANK_92 — Lab Sample ID: 240-159834-1

No Detections.

Client Sample ID: MW-136S_110921 — Lab Sample ID: 240-159834-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159834-1

Client Sample ID: TRIP BLANK_92

Date Collected: 11/09/21 00:00
Date Received: 11/11/21 08:00

Lab Sample ID: 240-159834-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 16:48	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 16:48	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 16:48	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 16:48	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 16:48	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 16:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*		*11/18/21 16:48*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/18/21 16:48*	*1*
Toluene-d8 (Surr)	*92*		*78 - 122*		*11/18/21 16:48*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*11/18/21 16:48*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159834-1

Client Sample ID: MW-136S_110921
Date Collected: 11/09/21 10:28
Date Received: 11/11/21 08:00

Lab Sample ID: 240-159834-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/13/21 01:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*74*		*66 - 120*		*11/13/21 01:34*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 19:18	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 19:18	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 19:18	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 19:18	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 19:18	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 19:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/18/21 19:18*	*1*
4-Bromofluorobenzene (Surr)	*83*		*56 - 136*		*11/18/21 19:18*	*1*
Toluene-d8 (Surr)	*94*		*78 - 122*		*11/18/21 19:18*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/18/21 19:18*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159834-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159834-1	TRIP BLANK_92	90	82	92	95
240-159834-2	MW-136S_110921	92	83	94	100
240-159848-E-3 MS	Matrix Spike	89	93	92	95
240-159848-E-3 MSD	Matrix Spike Duplicate	86	95	94	94
LCS 240-513621/5	Lab Control Sample	87	90	95	94
MB 240-513621/8	Method Blank	90	84	93	99

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159541-G-2 MS	Matrix Spike	77
240-159541-M-2 MSD	Matrix Spike Duplicate	78
240-159834-2	MW-136S_110921	74
LCS 240-512785/4	Lab Control Sample	79
MB 240-512785/5	Method Blank	79

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513621/8
Matrix: Water
Analysis Batch: 513621

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 15:31	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 15:31	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 15:31	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 15:31	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 15:31	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 15:31	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*		*11/18/21 15:31*	*1*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*		*11/18/21 15:31*	*1*
Toluene-d8 (Surr)	*93*		*78 - 122*		*11/18/21 15:31*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/18/21 15:31*	*1*

Lab Sample ID: LCS 240-513621/5
Matrix: Water
Analysis Batch: 513621

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	26.8		ug/L		107	63 - 134
cis-1,2-Dichloroethene	25.0	24.6		ug/L		99	77 - 123
Tetrachloroethene	25.0	26.5		ug/L		106	76 - 123
trans-1,2-Dichloroethene	25.0	25.6		ug/L		102	75 - 124
Trichloroethene	25.0	25.5		ug/L		102	70 - 122
Vinyl chloride	25.0	20.1		ug/L		81	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*87*		*62 - 137*
4-Bromofluorobenzene (Surr)	*90*		*56 - 136*
Toluene-d8 (Surr)	*95*		*78 - 122*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: 240-159848-E-3 MS
Matrix: Water
Analysis Batch: 513621

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	2.0	U	50.0	52.2		ug/L		104	56 - 135
cis-1,2-Dichloroethene	2.0	U	50.0	52.0		ug/L		104	66 - 128
Tetrachloroethene	2.0	U	50.0	56.8		ug/L		114	62 - 131
trans-1,2-Dichloroethene	2.0	U	50.0	51.2		ug/L		102	56 - 136
Trichloroethene	2.0	U	50.0	51.9		ug/L		104	61 - 124
Vinyl chloride	2.0	U	50.0	41.8		ug/L		84	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*62 - 137*
4-Bromofluorobenzene (Surr)	*93*		*56 - 136*
Toluene-d8 (Surr)	*92*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159848-E-3 MS
Matrix: Water
Analysis Batch: 513621

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*95*		*73 - 120*

Lab Sample ID: 240-159848-E-3 MSD
Matrix: Water
Analysis Batch: 513621

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	2.0	U	50.0	49.7		ug/L		99	56 - 135	5	26
cis-1,2-Dichloroethene	2.0	U	50.0	48.6		ug/L		97	66 - 128	7	14
Tetrachloroethene	2.0	U	50.0	55.3		ug/L		111	62 - 131	3	20
trans-1,2-Dichloroethene	2.0	U	50.0	48.6		ug/L		97	56 - 136	5	15
Trichloroethene	2.0	U	50.0	49.9		ug/L		100	61 - 124	4	15
Vinyl chloride	2.0	U	50.0	38.6		ug/L		77	43 - 157	8	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*
4-Bromofluorobenzene (Surr)	*95*		*56 - 136*
Toluene-d8 (Surr)	*94*		*78 - 122*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512785/5
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 18:32	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*66 - 120*		*11/12/21 18:32*	*1*

Lab Sample ID: LCS 240-512785/4
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.7		ug/L		107	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*66 - 120*

Lab Sample ID: 240-159541-G-2 MS
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

Lab Sample ID: 240-159541-M-2 MSD
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.4		ug/L		104	51 - 153	2	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159834-1

GC/MS VOA

Analysis Batch: 512785

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159834-2	MW-136S_110921	Total/NA	Water	8260B SIM	
MB 240-512785/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512785/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159541-G-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159541-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513621

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159834-1	TRIP BLANK_92	Total/NA	Water	8260B	
240-159834-2	MW-136S_110921	Total/NA	Water	8260B	
MB 240-513621/8	Method Blank	Total/NA	Water	8260B	
LCS 240-513621/5	Lab Control Sample	Total/NA	Water	8260B	
240-159848-E-3 MS	Matrix Spike	Total/NA	Water	8260B	
240-159848-E-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159834-1

Client Sample ID: TRIP BLANK_92

Lab Sample ID: 240-159834-1

Date Collected: 11/09/21 00:00

Matrix: Water

Date Received: 11/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513621	11/18/21 16:48	SAM	TAL CAN

Client Sample ID: MW-136S_110921

Lab Sample ID: 240-159834-2

Date Collected: 11/09/21 10:28

Matrix: Water

Date Received: 11/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513621	11/18/21 19:18	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	512785	11/13/21 01:34	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159834-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	For lab use only
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		Walk-in client
Phone: 248-994-2240	Sampler Name: Sommer Guy	TAT if different from below: 10 day; 3 weeks, ✓ 2 weeks, 1 week, 2 days, 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30080642.402.04	Shipping/Tracking No:			
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_92	—	—		X						1							X	X	X	X	X	X	X	1 Trip Blank
MW-136S_110921	11/9/21	10:28		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159834 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; ✓ Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: Sommer Guy	Arcadis	11/9/21 15:00	Received by: Novi Cold Storage	Arcadis	11/9/21 15:00
Relinquished by:	Arcadis	11/10/21	Received by:	ETA	11/10/21 1024
Relinquished by:	ETA	11/10/21 1043	Received in Laboratory by:	ETA	11-11-21 800

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11/26/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 159834
Canton Facility

Client Arcadis Site Name

Cooler Received on 11-11-21 Opened on 11-11-21

Cooler unpacked by: Tanya Berg

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # 1A Foam Box Client Cooler Box Other

Packing material used: ~~Bubble Wrap~~ Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 4.5 °C Corrected Cooler Temp. 4.6 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?	(Y)	(Y) (Y)
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# HC157842
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 60358	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

NO SIM on TB per Corrected COC. mw 11/11/21

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

November 26, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159834-1
Sample date: 2021-11-09
Report received by CADENA: 2021-11-26
Initial Data Verification completed by CADENA: 2021-11-26
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159834-1

		Sample Name:	TRIP BLANK_92				MW-136S_110921			
		Lab Sample ID:	2401598341				2401598342			
		Sample Date:	11/9/2021				11/9/2021			
	Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC										
	OSW-8260B									
	1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	OSW-8260BBSim									
	1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

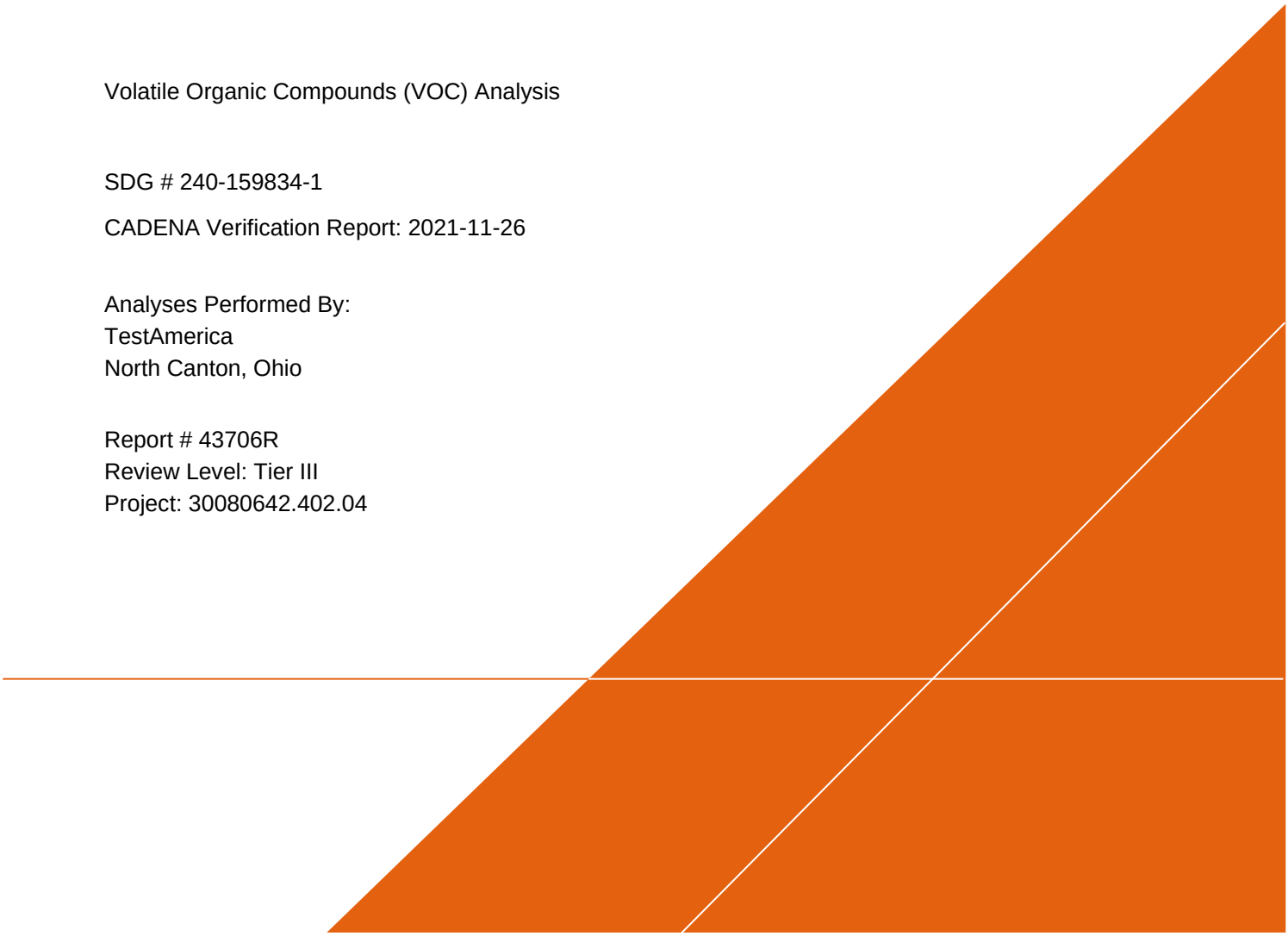
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159834-1

CADENA Verification Report: 2021-11-26

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43706R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159834-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_92	240-159834-1	Water	11/09/21		X	
MW-136S_110921	240-159834-2	Water	11/09/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 14, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 14, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Sommer Guy	TAT if different from below: 10 day; 3 weeks, ✓ 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_92	—	—		X						1							X	X	X	X	X	X	X	1 Trip Blank
MW-136S_110921	11/9/21	10:28		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159834 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; ✓ Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: Sommer Guy	Arcadis	11/9/21 15:00	Received by: Novi Cold Storage	Arcadis	11/9/21 15:00
Relinquished by:	Arcadis	11/10/21	Received by:	ETA	11/10/21 1026
Relinquished by:	ETA	11/10/21 1041	Received in Laboratory by:	ETA	11-11-21 800

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Client Sample ID: TRIP BLANK_92
Lab Sample ID: 240-159834-1
Date Collected: 11/09/21 00:00
Matrix: Water
Date Received: 11/11/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 16:48	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 16:48	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 16:48	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 16:48	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 16:48	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 16:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*		*11/18/21 16:48*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/18/21 16:48*	*1*
Toluene-d8 (Surr)	*92*		*78 - 122*		*11/18/21 16:48*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*11/18/21 16:48*	*1*

Client Sample ID: MW-136S_110921
Lab Sample ID: 240-159834-2
Date Collected: 11/09/21 10:28
Matrix: Water
Date Received: 11/11/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/13/21 01:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*74*		*66 - 120*		*11/13/21 01:34*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 19:18	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 19:18	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 19:18	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 19:18	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 19:18	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 19:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/18/21 19:18*	*1*
4-Bromofluorobenzene (Surr)	*83*		*56 - 136*		*11/18/21 19:18*	*1*
Toluene-d8 (Surr)	*94*		*78 - 122*		*11/18/21 19:18*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/18/21 19:18*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159634-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/23/2021 10:32:05 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159634-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159634-1

Job ID: 240-159634-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159634-1

Comments
No additional comments.

Receipt
The samples were received on 11/9/2021 10:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 3.7º C and 3.8º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159634-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159634-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159634-1	TRIP BLANK_58	Water	11/05/21 00:00	11/09/21 10:00
240-159634-2	MW-138S_110521	Water	11/05/21 10:35	11/09/21 10:00
240-159634-3	DUP-11	Water	11/05/21 00:00	11/09/21 10:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159634-1

Client Sample ID: TRIP BLANK_58 — Lab Sample ID: 240-159634-1

No Detections.

Client Sample ID: MW-138S_110521 — Lab Sample ID: 240-159634-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.89	J	2.0	0.86	ug/L	1		8260B SIM	Total/NA
Vinyl chloride	1.3		1.0	0.45	ug/L	1		8260B	Total/NA

Client Sample ID: DUP-11 — Lab Sample ID: 240-159634-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	1.3		1.0	0.45	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159634-1

Client Sample ID: TRIP BLANK_58

Date Collected: 11/05/21 00:00
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159634-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 21:47	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 21:47	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 21:47	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 21:47	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 21:47	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 21:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*62 - 137*		*11/16/21 21:47*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/16/21 21:47*	*1*
Toluene-d8 (Surr)	*90*		*78 - 122*		*11/16/21 21:47*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/16/21 21:47*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159634-1

Client Sample ID: MW-138S_110521
Date Collected: 11/05/21 10:35
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159634-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**0.89**	**J**	2.0	0.86	ug/L			11/17/21 01:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*11/17/21 01:23*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 23:02	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 23:02	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 23:02	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 23:02	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 23:02	1
Vinyl chloride	**1.3**		1.0	0.45	ug/L			11/16/21 23:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*11/16/21 23:02*	*1*
4-Bromofluorobenzene (Surr)	*86*		*56 - 136*		*11/16/21 23:02*	*1*
Toluene-d8 (Surr)	*93*		*78 - 122*		*11/16/21 23:02*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/16/21 23:02*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159634-1

Client Sample ID: DUP-11
Date Collected: 11/05/21 00:00
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159634-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 01:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/17/21 01:46*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 23:28	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 23:28	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 23:28	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 23:28	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 23:28	1
Vinyl chloride	**1.3**		1.0	0.45	ug/L			11/16/21 23:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/16/21 23:28*	*1*
4-Bromofluorobenzene (Surr)	*83*		*56 - 136*		*11/16/21 23:28*	*1*
Toluene-d8 (Surr)	*92*		*78 - 122*		*11/16/21 23:28*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/16/21 23:28*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159634-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159556-A-21 MS	Matrix Spike	88	90	93	97
240-159556-A-21 MSD	Matrix Spike Duplicate	86	90	92	94
240-159634-1	TRIP BLANK_58	94	82	90	99
240-159634-2	MW-138S_110521	96	86	93	101
240-159634-3	DUP-11	99	83	92	102
LCS 240-513207/5	Lab Control Sample	86	91	94	94
MB 240-513207/8	Method Blank	94	85	91	102

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159546-G-2 MS	Matrix Spike	82
240-159546-M-2 MSD	Matrix Spike Duplicate	85
240-159634-2	MW-138S_110521	83
240-159634-3	DUP-11	84
LCS 240-513286/4	Lab Control Sample	82
MB 240-513286/5	Method Blank	85

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513207/8
Matrix: Water
Analysis Batch: 513207

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 14:40	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 14:40	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 14:40	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 14:40	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 14:40	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 14:40	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*62 - 137*		*11/16/21 14:40*	*1*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*		*11/16/21 14:40*	*1*
Toluene-d8 (Surr)	*91*		*78 - 122*		*11/16/21 14:40*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/16/21 14:40*	*1*

Lab Sample ID: LCS 240-513207/5
Matrix: Water
Analysis Batch: 513207

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	26.9		ug/L		107	63 - 134
cis-1,2-Dichloroethene	25.0	24.4		ug/L		98	77 - 123
Tetrachloroethene	25.0	27.1		ug/L		108	76 - 123
trans-1,2-Dichloroethene	25.0	25.3		ug/L		101	75 - 124
Trichloroethene	25.0	26.3		ug/L		105	70 - 122
Vinyl chloride	25.0	20.2		ug/L		81	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*
4-Bromofluorobenzene (Surr)	*91*		*56 - 136*
Toluene-d8 (Surr)	*94*		*78 - 122*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: 240-159556-A-21 MS
Matrix: Water
Analysis Batch: 513207

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	100	U	2500	2520		ug/L		101	56 - 135
cis-1,2-Dichloroethene	100	U	2500	2460		ug/L		98	66 - 128
Tetrachloroethene	3100		2500	5610		ug/L		100	62 - 131
trans-1,2-Dichloroethene	100	U	2500	2480		ug/L		99	56 - 136
Trichloroethene	83	J	2500	2530		ug/L		98	61 - 124
Vinyl chloride	100	U	2500	1980		ug/L		79	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*62 - 137*
4-Bromofluorobenzene (Surr)	*90*		*56 - 136*
Toluene-d8 (Surr)	*93*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159556-A-21 MS
Matrix: Water
Analysis Batch: 513207

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*97*		*73 - 120*

Lab Sample ID: 240-159556-A-21 MSD
Matrix: Water
Analysis Batch: 513207

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	100	U	2500	2510		ug/L		100	56 - 135	0	26
cis-1,2-Dichloroethene	100	U	2500	2470		ug/L		99	66 - 128	1	14
Tetrachloroethene	3100		2500	5590		ug/L		99	62 - 131	0	20
trans-1,2-Dichloroethene	100	U	2500	2480		ug/L		99	56 - 136	0	15
Trichloroethene	83	J	2500	2610		ug/L		101	61 - 124	3	15
Vinyl chloride	100	U	2500	1920		ug/L		77	43 - 157	3	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*
4-Bromofluorobenzene (Surr)	*90*		*56 - 136*
Toluene-d8 (Surr)	*92*		*78 - 122*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513286/5
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/16/21 19:44	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/16/21 19:44*	*1*

Lab Sample ID: LCS 240-513286/4
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.78		ug/L		98	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159546-G-2 MS
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	11.0		ug/L		110	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159546-M-2 MSD
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.83		ug/L		98	51 - 153	11	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159634-1

GC/MS VOA

Analysis Batch: 513207

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159634-1	TRIP BLANK_58	Total/NA	Water	8260B	
240-159634-2	MW-138S_110521	Total/NA	Water	8260B	
240-159634-3	DUP-11	Total/NA	Water	8260B	
MB 240-513207/8	Method Blank	Total/NA	Water	8260B	
LCS 240-513207/5	Lab Control Sample	Total/NA	Water	8260B	
240-159556-A-21 MS	Matrix Spike	Total/NA	Water	8260B	
240-159556-A-21 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 513286

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159634-2	MW-138S_110521	Total/NA	Water	8260B SIM	
240-159634-3	DUP-11	Total/NA	Water	8260B SIM	
MB 240-513286/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513286/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159546-G-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159546-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159634-1

Client Sample ID: TRIP BLANK_58

Lab Sample ID: 240-159634-1
Date Collected: 11/05/21 00:00
Matrix: Water
Date Received: 11/09/21 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513207	11/16/21 21:47	SAM	TAL CAN

Client Sample ID: MW-138S_110521

Lab Sample ID: 240-159634-2
Date Collected: 11/05/21 10:35
Matrix: Water
Date Received: 11/09/21 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513207	11/16/21 23:02	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	513286	11/17/21 01:23	CS	TAL CAN

Client Sample ID: DUP-11

Lab Sample ID: 240-159634-3
Date Collected: 11/05/21 00:00
Matrix: Water
Date Received: 11/09/21 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513207	11/16/21 23:28	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	513286	11/17/21 01:46	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159634-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

MICHIGAN 190

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Sommer Guy	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_58	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1385_110521	11/5/21	10:35		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
DUP-11	11/5/21	—		X						6					N	G	X	X	X	X	X	X	X	

240-159634 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by: Sommer Guy	Company: Arcadis	Date/Time: 11/5/21 13:00	Received by: Novi Cold storage	Company: Arcadis	Date/Time: 11/5/21 13:00
Relinquished by:	Company: ARCADIS	Date/Time: 11/8/21 1200	Received by:	Company: ETA	Date/Time: 11/8/21 1200
Relinquished by:	Company: ETA	Date/Time: 11/8/21	Received in Laboratory by:	Company: ETA	Date/Time: 11-9-21 1000

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11/23/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 159634
Canton Facility

Client ARCADIS Site Name _____ Cooler unpacked by: Tammy Dayer

Cooler Received on 11-9-21 Opened on 11-9-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 2 Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
   -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? Yes No
11. Sufficient quantity received to perform indicated analyses? ~~Yes No~~ Yes 11/11/21
12. Are these work share samples and all listed on the COC? Yes No
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# **HC157842**
14. Were VOAs on the COC? Yes No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 60358 Yes No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

The TB is not logged for SIM ~~due to insufficient volume.~~ per corrected COC. 11/11/21 11-9-21

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

WI-NC-099

Login # : 159634

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form				
Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
(TA) Client Box Other	(IR-14) IR-15	3.6	3.7	(Wet Ice) Blue Ice Dry Ice Water None
(TA) Client Box Other	(IR-14) IR-15	3.7	3.8	(Wet Ice) Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice

DATA VERIFICATION REPORT

November 23, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159634-1
Sample date: 2021-11-05
Report received by CADENA: 2021-11-23
Initial Data Verification completed by CADENA: 2021-11-23
Number of Samples:3
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159634-1

		Sample Name:	TRIP BLANK_58				MW-138S_110521				DUP-11			
		Lab Sample ID:	2401596341				2401596342				2401596343			
		Sample Date:	11/5/2021				11/5/2021				11/5/2021			
Analyte	Cas No.		Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC														
OSW-8260B														
1,1-Dichloroethene	75-35-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4		ND	1.0	ug/l	---	1.3	1.0	ug/l	---	1.3	1.0	ug/l	---
OSW-8260BBSim														
1,4-Dioxane	123-91-1						0.89	2.0	ug/l	J	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

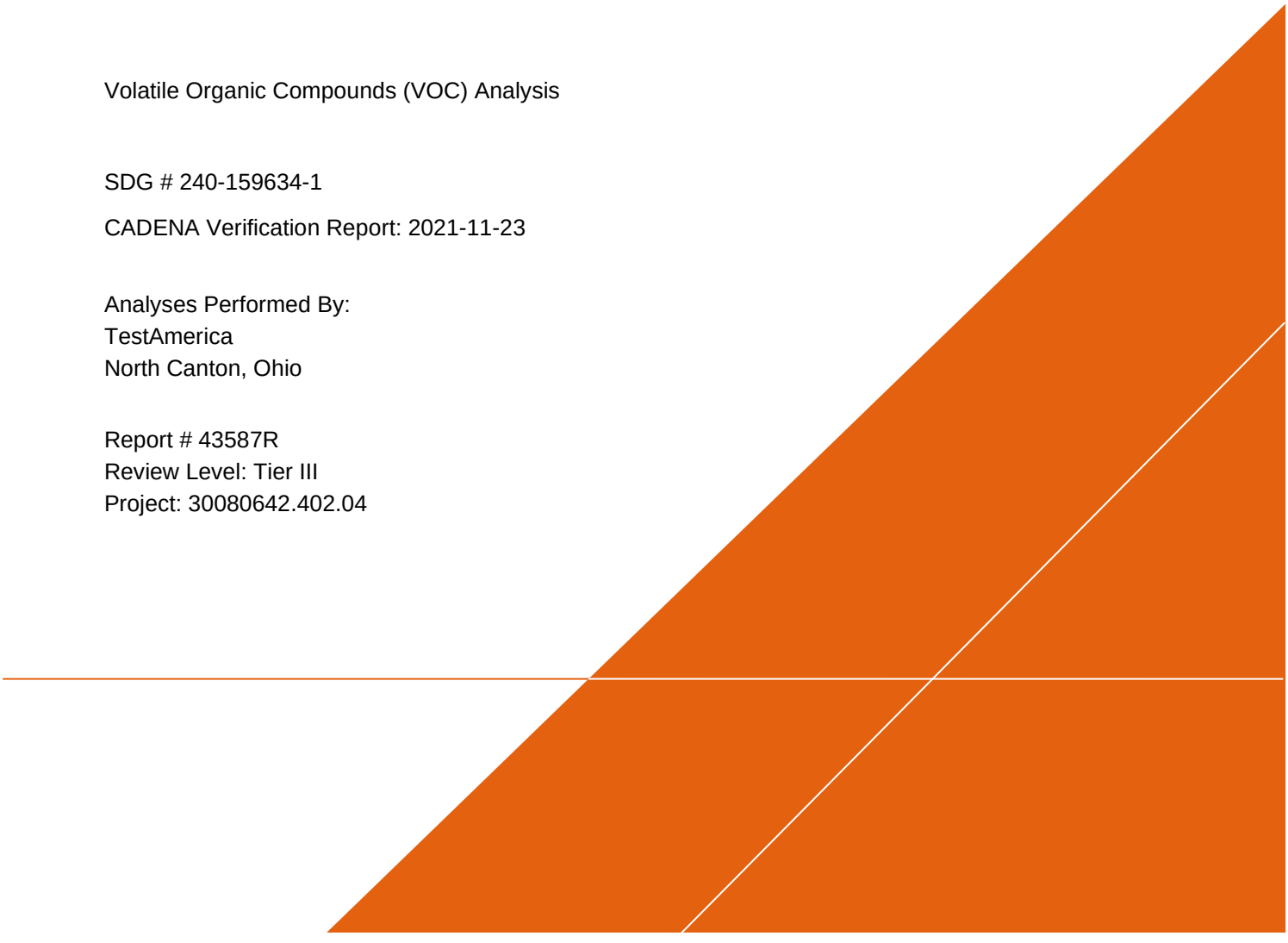
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159634-1

CADENA Verification Report: 2021-11-23

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43587R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159634-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_58	240-159634-1	Water	11/05/21		X	
MW-138S_110521	240-159634-2	Water	11/05/21		X	X
DUP-11	240-159634-3	Water	11/05/21	MW-138S_110521	X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.
  - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
  - E The compound was quantitated above the calibration range.
  - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
  - J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
  - UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
  - J+ The result is an estimated quantity, but the result may be biased high.
  - J- The result is an estimated quantity, but the result may be biased low.
  - UB Analyte considered non-detect at the listed value due to associated blank contamination.
  - N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
  - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

DATA REVIEW

Sample ID/Duplicate ID	Compounds	Sample Result (µg/L)	Duplicate Result (µg/L)	RPD
MW-138S_110521 / DUP-11	1,4-Dioxane	0.89	2 U	AC
	Vinyl chloride	1.3	1.3	AC

Notes:

AC – Acceptable

The calculated differences between the parent sample and field duplicate were acceptable.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE:

DATE: December 15, 2021

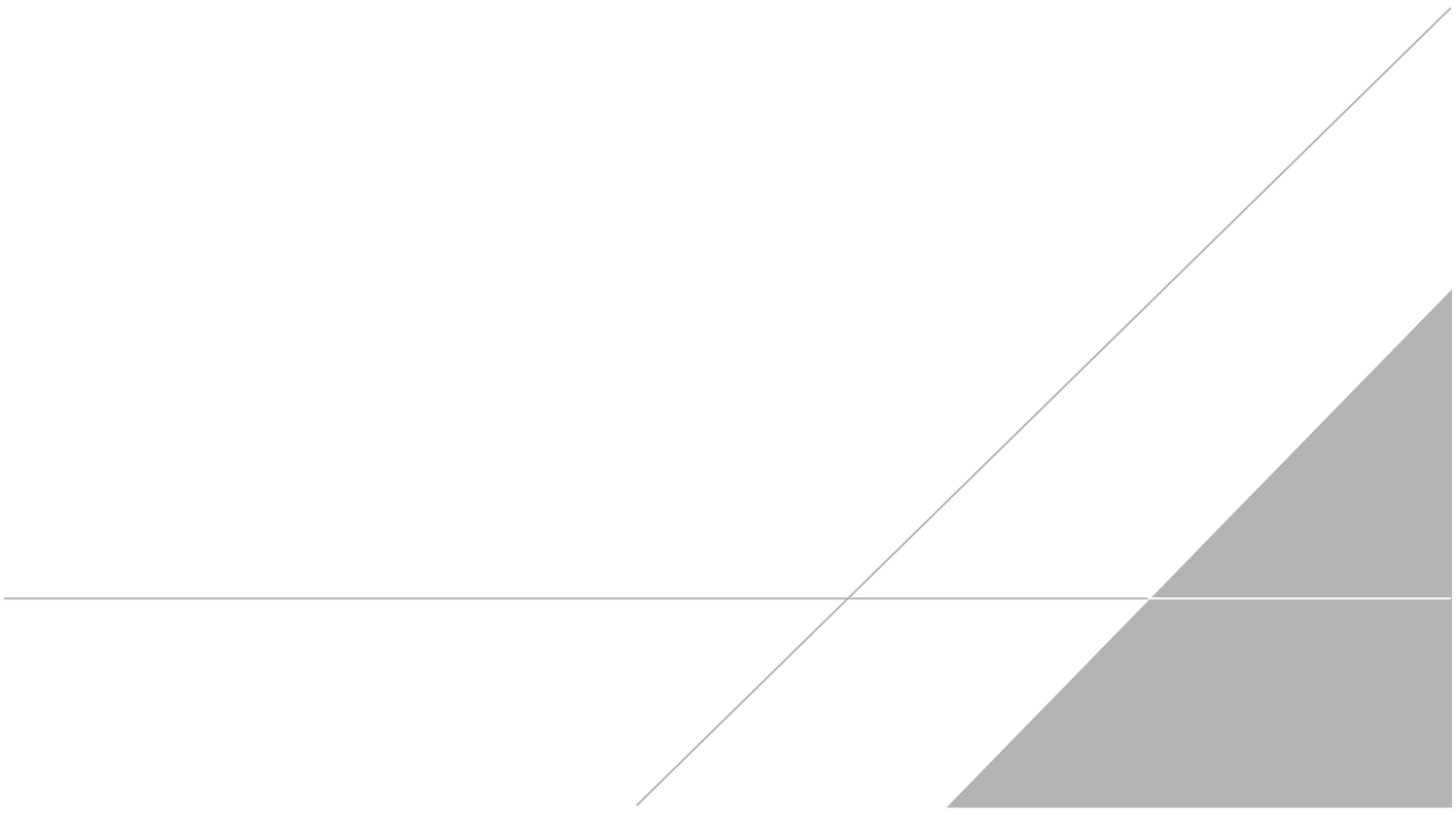
PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



Chain of Custody Record

MICHIGAN 190

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Sommer Guy	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_58	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1385_110521	11/5/21	10:35		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
DUP-11	11/5/21	—		X						6					N	G	X	X	X	X	X	X	X	

240-159634 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by: Sommer Guy	Company: Arcadis	Date/Time: 11/5/21 13:00	Received by: Novi Cold storage	Company: Arcadis	Date/Time: 11/5/21 13:00
Relinquished by:	Company: ARCADIS	Date/Time: 11/8/21 1200	Received by:	Company: ETA	Date/Time: 11/8/21 1200
Relinquished by:	Company: ETA	Date/Time: 11/8/21	Received in Laboratory by:	Company: ETA	Date/Time: 11-9-21 1000

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11/23/2021

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159634-1

Client Sample ID: TRIP BLANK_58

Date Collected: 11/05/21 00:00
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159634-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 21:47	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 21:47	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 21:47	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 21:47	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 21:47	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 21:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*62 - 137*		*11/16/21 21:47*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/16/21 21:47*	*1*
Toluene-d8 (Surr)	*90*		*78 - 122*		*11/16/21 21:47*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/16/21 21:47*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159634-1

Client Sample ID: MW-138S_110521
Date Collected: 11/05/21 10:35
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159634-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**0.89**	**J**	2.0	0.86	ug/L			11/17/21 01:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*11/17/21 01:23*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 23:02	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 23:02	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 23:02	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 23:02	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 23:02	1
Vinyl chloride	**1.3**		1.0	0.45	ug/L			11/16/21 23:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*11/16/21 23:02*	*1*
4-Bromofluorobenzene (Surr)	*86*		*56 - 136*		*11/16/21 23:02*	*1*
Toluene-d8 (Surr)	*93*		*78 - 122*		*11/16/21 23:02*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/16/21 23:02*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159634-1

Client Sample ID: DUP-11
Date Collected: 11/05/21 00:00
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159634-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 01:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/17/21 01:46*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 23:28	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 23:28	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 23:28	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 23:28	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 23:28	1
Vinyl chloride	**1.3**		1.0	0.45	ug/L			11/16/21 23:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/16/21 23:28*	*1*
4-Bromofluorobenzene (Surr)	*83*		*56 - 136*		*11/16/21 23:28*	*1*
Toluene-d8 (Surr)	*92*		*78 - 122*		*11/16/21 23:28*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/16/21 23:28*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159526-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/22/2021 8:26:52 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159526-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159526-1

Job ID: 240-159526-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159526-1

Comments
No additional comments.

Receipt
The samples were received on 11/6/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.0º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159526-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159526-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159526-1	TRIP BLANK_50	Water	11/04/21 00:00	11/06/21 08:00
240-159526-2	MW-192S_110421	Water	11/04/21 15:43	11/06/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159526-1

Client Sample ID: TRIP BLANK_50 — Lab Sample ID: 240-159526-1

No Detections.

Client Sample ID: MW-192S_110421 — Lab Sample ID: 240-159526-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159526-1

Client Sample ID: TRIP BLANK_50
Date Collected: 11/04/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159526-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 00:37	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 00:37	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 00:37	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 00:37	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 00:37	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 00:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*11/13/21 00:37*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/13/21 00:37*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/13/21 00:37*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/13/21 00:37*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159526-1

Client Sample ID: MW-192S_110421
Date Collected: 11/04/21 15:43
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159526-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 04:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*66 - 120*		*11/12/21 04:37*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 00:59	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 00:59	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 00:59	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 00:59	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 00:59	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 00:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*62 - 137*		*11/13/21 00:59*	*1*
4-Bromofluorobenzene (Surr)	*77*		*56 - 136*		*11/13/21 00:59*	*1*
Toluene-d8 (Surr)	*107*		*78 - 122*		*11/13/21 00:59*	*1*
Dibromofluoromethane (Surr)	*97*		*73 - 120*		*11/13/21 00:59*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159526-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159526-1	TRIP BLANK_50	96	81	108	98
240-159526-2	MW-192S_110421	95	77	107	97
240-159536-A-3 MS	Matrix Spike	93	86	114	94
240-159536-E-3 MSD	Matrix Spike Duplicate	98	93	112	97
LCS 240-512748/4	Lab Control Sample	93	91	113	93
MB 240-512748/6	Method Blank	92	79	103	92

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159418-H-2 MS	Matrix Spike	82
240-159418-P-2 MSD	Matrix Spike Duplicate	83
240-159526-2	MW-192S_110421	79
LCS 240-512585/4	Lab Control Sample	81
MB 240-512585/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512748/6
Matrix: Water
Analysis Batch: 512748

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 23:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 23:07	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 23:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 23:07	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 23:07	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 23:07	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/12/21 23:07*	*1*
4-Bromofluorobenzene (Surr)	*79*		*56 - 136*		*11/12/21 23:07*	*1*
Toluene-d8 (Surr)	*103*		*78 - 122*		*11/12/21 23:07*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*11/12/21 23:07*	*1*

Lab Sample ID: LCS 240-512748/4
Matrix: Water
Analysis Batch: 512748

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.3		ug/L		103	63 - 134
cis-1,2-Dichloroethene	10.0	9.94		ug/L		99	77 - 123
Tetrachloroethene	10.0	10.8		ug/L		108	76 - 123
trans-1,2-Dichloroethene	10.0	10.1		ug/L		101	75 - 124
Trichloroethene	10.0	8.81		ug/L		88	70 - 122
Vinyl chloride	10.0	10.0		ug/L		100	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*91*		*56 - 136*
Toluene-d8 (Surr)	*113*		*78 - 122*
Dibromofluoromethane (Surr)	*93*		*73 - 120*

Lab Sample ID: 240-159536-A-3 MS
Matrix: Water
Analysis Batch: 512748

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.26		ug/L		93	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	10.1		ug/L		101	66 - 128
Tetrachloroethene	1.0	U	10.0	9.29		ug/L		93	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.49		ug/L		95	56 - 136
Trichloroethene	1.0	U	10.0	7.71		ug/L		77	61 - 124
Vinyl chloride	1.0	U	10.0	8.69		ug/L		87	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*86*		*56 - 136*
Toluene-d8 (Surr)	*114*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159536-A-3 MS
Matrix: Water
Analysis Batch: 512748

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: 240-159536-E-3 MSD
Matrix: Water
Analysis Batch: 512748

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.41		ug/L		94	56 - 135	2	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.89		ug/L		99	66 - 128	2	14
Tetrachloroethene	1.0	U	10.0	9.07		ug/L		91	62 - 131	2	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.73		ug/L		97	56 - 136	2	15
Trichloroethene	1.0	U	10.0	7.96		ug/L		80	61 - 124	3	15
Vinyl chloride	1.0	U	10.0	9.96		ug/L		100	43 - 157	14	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*
4-Bromofluorobenzene (Surr)	*93*		*56 - 136*
Toluene-d8 (Surr)	*112*		*78 - 122*
Dibromofluoromethane (Surr)	*97*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512585/5
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/11/21 19:04	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/11/21 19:04*	*1*

Lab Sample ID: LCS 240-512585/4
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.86		ug/L		99	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*

Lab Sample ID: 240-159418-H-2 MS
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	11.1		ug/L		111	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159418-P-2 MSD
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.2		ug/L		102	51 - 153	8	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159526-1

GC/MS VOA

Analysis Batch: 512585

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159526-2	MW-192S_110421	Total/NA	Water	8260B SIM	
MB 240-512585/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512585/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159418-H-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159418-P-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 512748

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159526-1	TRIP BLANK_50	Total/NA	Water	8260B	
240-159526-2	MW-192S_110421	Total/NA	Water	8260B	
MB 240-512748/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512748/4	Lab Control Sample	Total/NA	Water	8260B	
240-159536-A-3 MS	Matrix Spike	Total/NA	Water	8260B	
240-159536-E-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159526-1

Client Sample ID: TRIP BLANK_50

Lab Sample ID: 240-159526-1

Date Collected: 11/04/21 00:00

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512748	11/13/21 00:37	LEE	TAL CAN

Client Sample ID: MW-192S_110421

Lab Sample ID: 240-159526-2

Date Collected: 11/04/21 15:43

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512748	11/13/21 00:59	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512585	11/12/21 04:37	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159526-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: SOMMER GUY	TAT if different from below: ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client:
Phone: 248-994-2240	Method of Shipment/Carrier:	10 day		Lab sampling:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 50	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-19S_110421	11/4/21	15:43		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159526 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalla@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Sommer Guy	Arcadis	11/4/21 16:30	Novi cold storage	Arcadis	11/4/21 16:30
[signature]	ARCADIS	11/5/21 / 1435	[signature]	ETA	11/5/21 1435
Teri Hale	ETA	11/5/21 1448	M. A. A.	ETA	11/6/21 8:00

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11/22/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 159526

Client ARCADIS Site Name _____

Cooler Received on 11/6/21 Opened on 11/6/21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Cooler unpacked by: Matthew Surma

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.9 °C Corrected Cooler Temp. 1.0 °C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes) No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes) No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes (No)
-Were tamper/custody seals intact and uncompromised?	(Yes) No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes (No)
4. Did custody papers accompany the sample(s)?	(Yes) No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes) No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?	
10. Were correct bottle(s) used for the test(s) indicated?	(Yes) No
11. Sufficient quantity received to perform indicated analyses?	(Yes) No
12. Are these work share samples and all listed on the COC?	Yes (No)
If yes, Questions 13-17 have been checked at the originating laboratory.	
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No (NA) pH Strip Lot# **HC157842**
14. Were VOAs on the COC?	(Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 0109201G	(Yes) No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes (No)

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by: _____

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

November 22, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159526-1
Sample date: 2021-11-04
Report received by CADENA: 2021-11-22
Initial Data Verification completed by CADENA: 2021-11-22
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159526-1

		Sample Name:	TRIP BLANK_50				MW-192S_110421			
		Lab Sample ID:	2401595261				2401595262			
		Sample Date:	11/4/2021				11/4/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

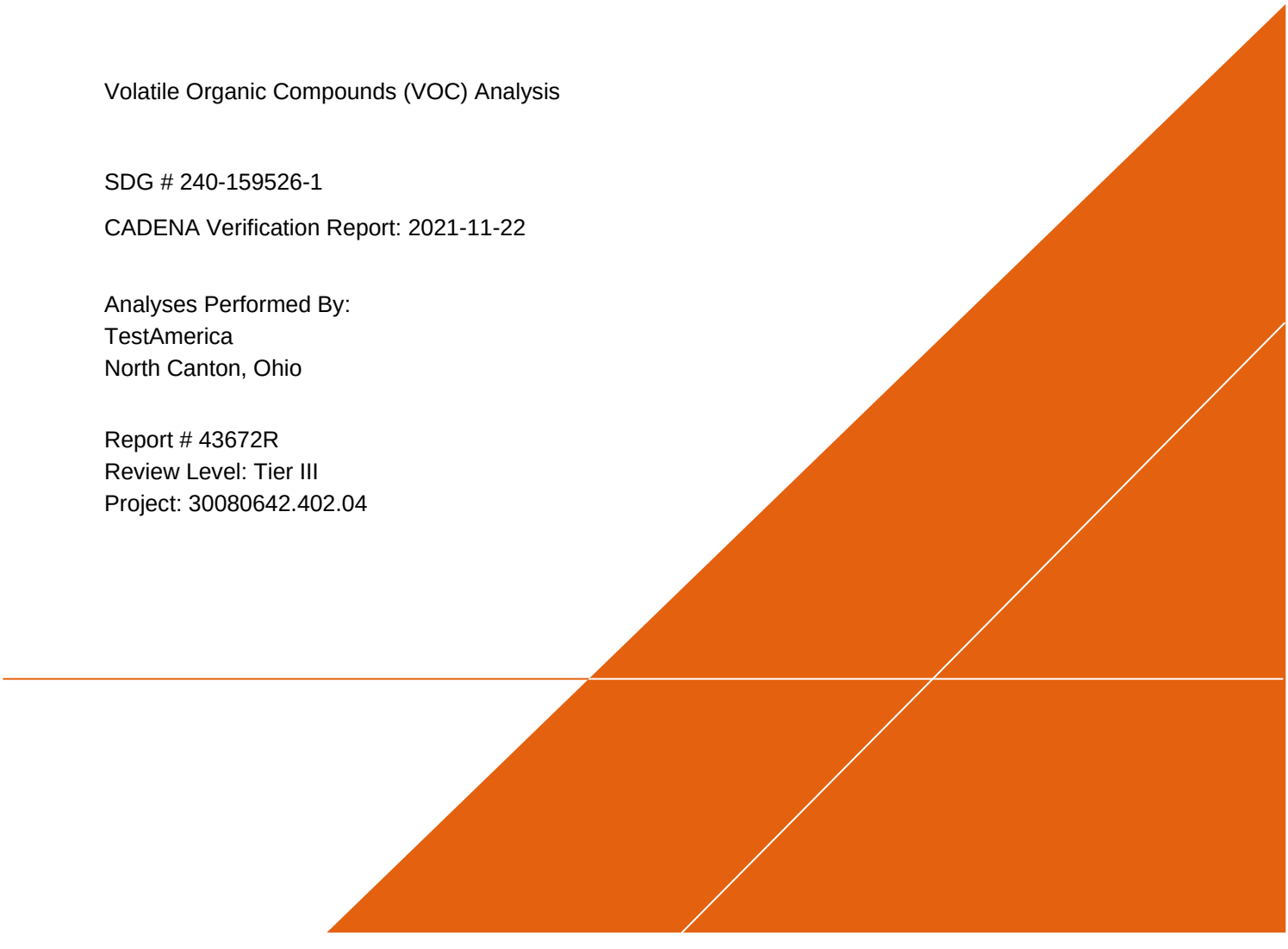
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159526-1

CADENA Verification Report: 2021-11-22

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43672R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159526-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_50	240-159526-1	Water	11/04/21		X	
MW-192S_110421	240-159526-2	Water	11/04/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 09, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 09, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: SOMMER GUY	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day — 10 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 50	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-19S_110421	11/4/21	15:43		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159526 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalla@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Sommer Guy	Arcadis	11/4/21 16:30	Novi cold storage	Arcadis	11/4/21 16:30
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	ARCADIS	11/5/21 1435	[signature]	ETA	11/5/21 1435
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
Jeri Hale	ETA	11/5/21 1448	M. A. A.	ETA	11/6/21 8:00

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11/22/2021

Client Sample ID: TRIP BLANK_50
Lab Sample ID: 240-159526-1
Date Collected: 11/04/21 00:00
Matrix: Water
Date Received: 11/06/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 00:37	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 00:37	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 00:37	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 00:37	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 00:37	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 00:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*11/13/21 00:37*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/13/21 00:37*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/13/21 00:37*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/13/21 00:37*	*1*

Client Sample ID: MW-192S_110421
Lab Sample ID: 240-159526-2
Date Collected: 11/04/21 15:43
Matrix: Water
Date Received: 11/06/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 04:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*66 - 120*		*11/12/21 04:37*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 00:59	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 00:59	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 00:59	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 00:59	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 00:59	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 00:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*62 - 137*		*11/13/21 00:59*	*1*
4-Bromofluorobenzene (Surr)	*77*		*56 - 136*		*11/13/21 00:59*	*1*
Toluene-d8 (Surr)	*107*		*78 - 122*		*11/13/21 00:59*	*1*
Dibromofluoromethane (Surr)	*97*		*73 - 120*		*11/13/21 00:59*	*1*

Appendix D

(Continued)

Groundwater and Soil Analytical Reports
(includes Golder Associates Historical Reports)

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159415-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/19/2021 1:47:56 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at:
www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159415-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159415-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159415-1

Comments
No additional comments.

Receipt
The samples were received on 11/5/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.7° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159415-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159415-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159415-1	TRIP BLANK_31	Water	11/03/21 00:00	11/05/21 08:00
240-159415-2	MW-189_110321	Water	11/03/21 10:20	11/05/21 08:00
240-159415-3	MW-189S_110321	Water	11/03/21 11:27	11/05/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159415-1

Client Sample ID: TRIP BLANK_31 — Lab Sample ID: 240-159415-1

No Detections.

Client Sample ID: MW-189_110321 — Lab Sample ID: 240-159415-2

No Detections.

Client Sample ID: MW-189S_110321 — Lab Sample ID: 240-159415-3

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159415-1

Client Sample ID: TRIP BLANK_31
Date Collected: 11/03/21 00:00
Date Received: 11/05/21 08:00

Lab Sample ID: 240-159415-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 17:16	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 17:16	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 17:16	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 17:16	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 17:16	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 17:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*62 - 137*		*11/13/21 17:16*	*1*
4-Bromofluorobenzene (Surr)	*74*		*56 - 136*		*11/13/21 17:16*	*1*
Toluene-d8 (Surr)	*103*		*78 - 122*		*11/13/21 17:16*	*1*
Dibromofluoromethane (Surr)	*90*		*73 - 120*		*11/13/21 17:16*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159415-1

Client Sample ID: MW-189_110321

Date Collected: 11/03/21 10:20
Date Received: 11/05/21 08:00

Lab Sample ID: 240-159415-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/11/21 21:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/11/21 21:51*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 17:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 17:38	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 17:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 17:38	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 17:38	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 17:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*62 - 137*		*11/13/21 17:38*	*1*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*		*11/13/21 17:38*	*1*
Toluene-d8 (Surr)	*110*		*78 - 122*		*11/13/21 17:38*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/13/21 17:38*	*1*

Client Sample ID: MW-189S_110321

Date Collected: 11/03/21 11:27
Date Received: 11/05/21 08:00

Lab Sample ID: 240-159415-3

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/11/21 22:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*11/11/21 22:15*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 18:00	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 18:00	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 18:00	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 18:00	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 18:00	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 18:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/13/21 18:00*	*1*
4-Bromofluorobenzene (Surr)	*80*		*56 - 136*		*11/13/21 18:00*	*1*
Toluene-d8 (Surr)	*103*		*78 - 122*		*11/13/21 18:00*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/13/21 18:00*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159415-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159415-1	TRIP BLANK_31	91	74	103	90
240-159415-2	MW-189_110321	95	78	110	96
240-159415-3	MW-189S_110321	99	80	103	98
240-159418-E-2 MS	Matrix Spike	93	87	106	94
240-159418-L-2 MSD	Matrix Spike Duplicate	90	87	107	91
LCS 240-512817/4	Lab Control Sample	90	89	112	90
MB 240-512817/6	Method Blank	98	81	112	98

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159415-2	MW-189_110321	84
240-159415-3	MW-189S_110321	82
240-159418-H-2 MS	Matrix Spike	82
240-159418-P-2 MSD	Matrix Spike Duplicate	83
LCS 240-512585/4	Lab Control Sample	81
MB 240-512585/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512817/6
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 13:55	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 13:55	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:55	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 13:55	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:55	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 13:55	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*		*11/13/21 13:55*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/13/21 13:55*	*1*
Toluene-d8 (Surr)	*112*		*78 - 122*		*11/13/21 13:55*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/13/21 13:55*	*1*

Lab Sample ID: LCS 240-512817/4
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.9		ug/L		109	63 - 134
cis-1,2-Dichloroethene	10.0	10.3		ug/L		103	77 - 123
Tetrachloroethene	10.0	11.9		ug/L		119	76 - 123
trans-1,2-Dichloroethene	10.0	10.8		ug/L		108	75 - 124
Trichloroethene	10.0	9.19		ug/L		92	70 - 122
Vinyl chloride	10.0	9.48		ug/L		95	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*89*		*56 - 136*
Toluene-d8 (Surr)	*112*		*78 - 122*
Dibromofluoromethane (Surr)	*90*		*73 - 120*

Lab Sample ID: 240-159418-E-2 MS
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	10.3		ug/L		103	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.89		ug/L		99	66 - 128
Tetrachloroethene	1.0	U	10.0	9.53		ug/L		95	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.91		ug/L		99	56 - 136
Trichloroethene	1.0	U	10.0	8.16		ug/L		82	61 - 124
Vinyl chloride	1.0	U	10.0	9.96		ug/L		100	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*106*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159418-E-2 MS
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: 240-159418-L-2 MSD
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	10.0		ug/L		100	56 - 135	2	26
cis-1,2-Dichloroethene	1.0	U	10.0	10.1		ug/L		101	66 - 128	2	14
Tetrachloroethene	1.0	U	10.0	10.1		ug/L		101	62 - 131	5	20
trans-1,2-Dichloroethene	1.0	U	10.0	10.1		ug/L		101	56 - 136	2	15
Trichloroethene	1.0	U	10.0	8.61		ug/L		86	61 - 124	5	15
Vinyl chloride	1.0	U	10.0	10.2		ug/L		102	43 - 157	3	24

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*107*		*78 - 122*
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512585/5
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/11/21 19:04	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/11/21 19:04*	*1*

Lab Sample ID: LCS 240-512585/4
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.86		ug/L		99	80 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*

Lab Sample ID: 240-159418-H-2 MS
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	11.1		ug/L		111	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159418-P-2 MSD
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.2		ug/L		102	51 - 153	8	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159415-1

GC/MS VOA

Analysis Batch: 512585

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159415-2	MW-189_110321	Total/NA	Water	8260B SIM	
240-159415-3	MW-189S_110321	Total/NA	Water	8260B SIM	
MB 240-512585/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512585/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159418-H-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159418-P-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 512817

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159415-1	TRIP BLANK_31	Total/NA	Water	8260B	
240-159415-2	MW-189_110321	Total/NA	Water	8260B	
240-159415-3	MW-189S_110321	Total/NA	Water	8260B	
MB 240-512817/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512817/4	Lab Control Sample	Total/NA	Water	8260B	
240-159418-E-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159418-L-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159415-1

Client Sample ID: TRIP BLANK_31

Lab Sample ID: 240-159415-1
Matrix: Water
Date Collected: 11/03/21 00:00
Date Received: 11/05/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512817	11/13/21 17:16	LEE	TAL CAN

Client Sample ID: MW-189_110321

Lab Sample ID: 240-159415-2
Matrix: Water
Date Collected: 11/03/21 10:20
Date Received: 11/05/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512817	11/13/21 17:38	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512585	11/11/21 21:51	CS	TAL CAN

Client Sample ID: MW-189S_110321

Lab Sample ID: 240-159415-3
Matrix: Water
Date Collected: 11/03/21 11:27
Date Received: 11/05/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512817	11/13/21 18:00	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512585	11/11/21 22:15	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159415-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Allyson Hartz	TAT if different from below: ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:	10 day ✓		Lab sampling:
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn/Ac/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_31	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-189_110321	11/3/21	1020		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-189S_110321	11/3/21	1127		X						6					N	G	X	X	X	X	X	X	X	↓

240-159415 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ✓ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Allyson Hartz	Arcadis	11/3/21 1630	Novi Cold Storage	Arcadis	11/3/21 1630
[signature]	ARCADIS	11/3/21 1040	[signature]	ETA	11/4/21 1041
[signature]	ETA	11/4/21 1049	M. [illegible]	ETA	11/5/21 8.00

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11/19/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159415**
Canton Facility

Client ARCADIS Site Name

Cooler unpacked by: Mathew Swna

Cooler Received on 11/5/21 Opened on 11/5/21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: ~~Wet Ice~~ Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.6 °C Corrected Cooler Temp. 0.7 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No	(NA) pH Strip Lot# HC157842
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 0104201G	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes	(No)

11-5-21

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page | Samples processed by:

TB is not logged for SIM due to insufficient volume.
11-5-21

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.

Sample(s) ____ were received in a broken container.

Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.

Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

November 19, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159415-1
Sample date: 2021-11-03
Report received by CADENA: 2021-11-19
Initial Data Verification completed by CADENA: 2021-11-19
Number of Samples:3
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159415-1

		Sample Name:	TRIP BLANK_31				MW-189_110321				MW-189S_110321			
		Lab Sample ID:	2401594151				2401594152				2401594153			
		Sample Date:	11/3/2021				11/3/2021				11/3/2021			
Analyte	Cas No.		Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC														
OSW-8260B														
1,1-Dichloroethene	75-35-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim														
1,4-Dioxane	123-91-1						ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

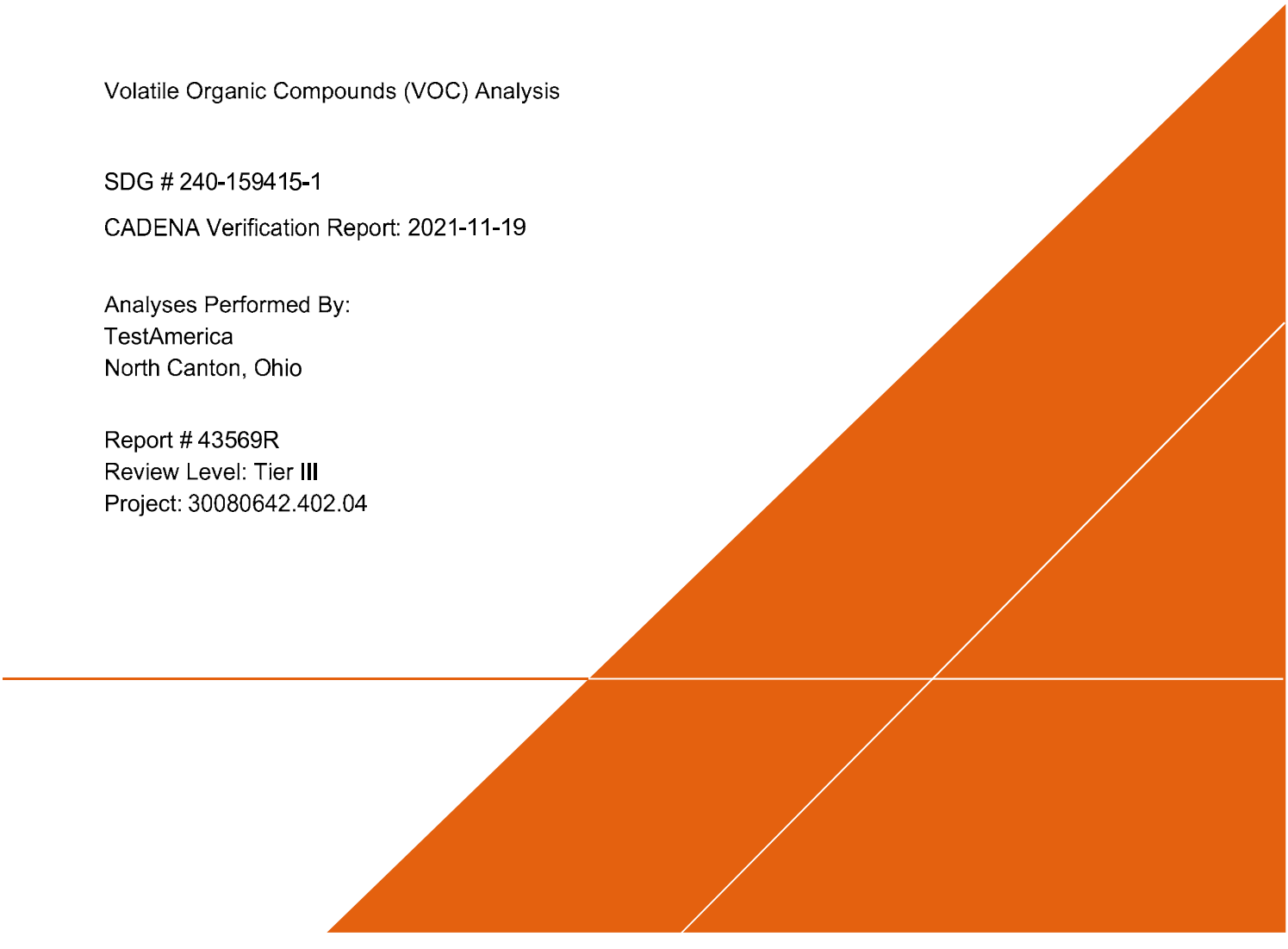
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159415-1

CADENA Verification Report: 2021-11-19

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43569R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159415-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_31	240-159415-1	Water	11/03/21		X	
MW-189_110321	240-159415-2	Water	11/03/21		X	X
MW-189S_110321	240-159415-3	Water	11/03/21		X	X

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.
  - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
  - E The compound was quantitated above the calibration range.
  - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
  - J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
  - UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
  - J+ The result is an estimated quantity, but the result may be biased high.
  - J- The result is an estimated quantity, but the result may be biased low.
  - UB Analyte considered non-detect at the listed value due to associated blank contamination.
  - N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
  - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE: 

DATE: December 07, 2021

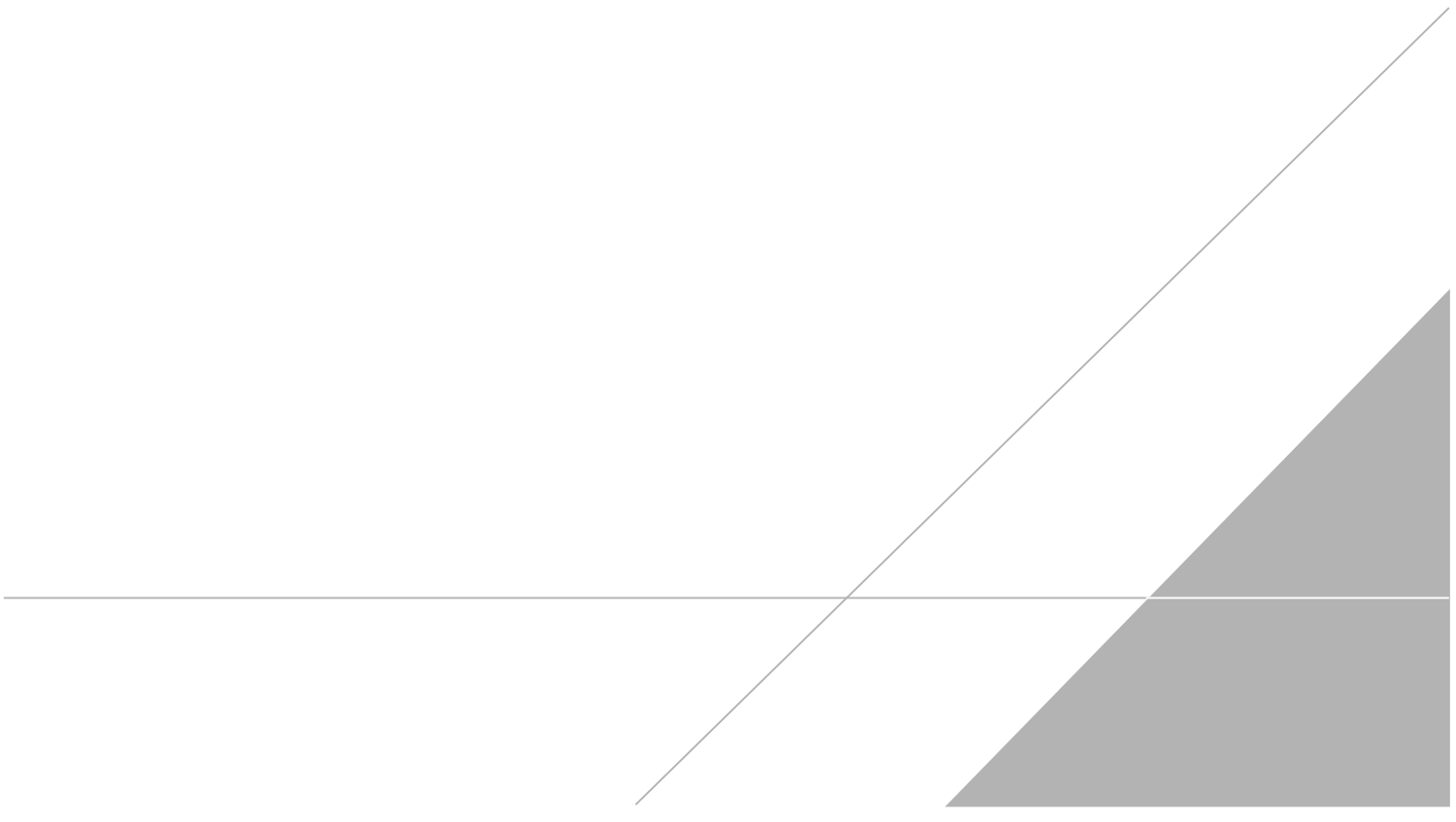
PEER REVIEW: Andrew Korycinski

DATE: December 8, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



MICHIGAN 190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Allyson Hartz	TAT if different from below: ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:	10 day ✓		Lab sampling:
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn/Ac/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_31	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-189_110321	11/3/21	1020		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-189S_110321	11/3/21	1127		X						6					N	G	X	X	X	X	X	X	X	↓

240-159415 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ✓ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Allyson Hartz	Arcadis	11/3/21 1630	Novi Cold Storage	Arcadis	11/3/21 1630
[signature]	ARCADIS	11/3/21 1040	[signature]	ETA	11/4/21 1041
[signature]	ETA	11/4/21 1049	M. [illegible]	ETA	11/5/21 8.00

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11/19/2021

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159415-1

Client Sample ID: TRIP BLANK_31
Date Collected: 11/03/21 00:00
Date Received: 11/05/21 08:00

Lab Sample ID: 240-159415-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 17:16	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 17:16	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 17:16	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 17:16	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 17:16	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 17:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*62 - 137*		*11/13/21 17:16*	*1*
4-Bromofluorobenzene (Surr)	*74*		*56 - 136*		*11/13/21 17:16*	*1*
Toluene-d8 (Surr)	*103*		*78 - 122*		*11/13/21 17:16*	*1*
Dibromofluoromethane (Surr)	*90*		*73 - 120*		*11/13/21 17:16*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159415-1

Client Sample ID: MW-189_110321

Date Collected: 11/03/21 10:20
Date Received: 11/05/21 08:00

Lab Sample ID: 240-159415-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/11/21 21:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/11/21 21:51*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 17:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 17:38	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 17:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 17:38	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 17:38	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 17:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*62 - 137*		*11/13/21 17:38*	*1*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*		*11/13/21 17:38*	*1*
Toluene-d8 (Surr)	*110*		*78 - 122*		*11/13/21 17:38*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/13/21 17:38*	*1*

Client Sample ID: MW-189S_110321

Date Collected: 11/03/21 11:27
Date Received: 11/05/21 08:00

Lab Sample ID: 240-159415-3

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/11/21 22:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*11/11/21 22:15*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 18:00	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 18:00	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 18:00	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 18:00	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 18:00	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 18:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/13/21 18:00*	*1*
4-Bromofluorobenzene (Surr)	*80*		*56 - 136*		*11/13/21 18:00*	*1*
Toluene-d8 (Surr)	*103*		*78 - 122*		*11/13/21 18:00*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/13/21 18:00*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159415-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/19/2021 1:47:56 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159415-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159415-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159415-1

Comments
No additional comments.

Receipt
The samples were received on 11/5/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.7° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159415-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159415-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159415-1	TRIP BLANK_31	Water	11/03/21 00:00	11/05/21 08:00
240-159415-2	MW-189_110321	Water	11/03/21 10:20	11/05/21 08:00
240-159415-3	MW-189S_110321	Water	11/03/21 11:27	11/05/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159415-1

Client Sample ID: TRIP BLANK_31 — Lab Sample ID: 240-159415-1

No Detections.

Client Sample ID: MW-189_110321 — Lab Sample ID: 240-159415-2

No Detections.

Client Sample ID: MW-189S_110321 — Lab Sample ID: 240-159415-3

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159415-1

Client Sample ID: TRIP BLANK_31
Date Collected: 11/03/21 00:00
Date Received: 11/05/21 08:00

Lab Sample ID: 240-159415-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 17:16	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 17:16	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 17:16	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 17:16	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 17:16	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 17:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*62 - 137*		*11/13/21 17:16*	*1*
4-Bromofluorobenzene (Surr)	*74*		*56 - 136*		*11/13/21 17:16*	*1*
Toluene-d8 (Surr)	*103*		*78 - 122*		*11/13/21 17:16*	*1*
Dibromofluoromethane (Surr)	*90*		*73 - 120*		*11/13/21 17:16*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159415-1

Client Sample ID: MW-189_110321

Date Collected: 11/03/21 10:20
Date Received: 11/05/21 08:00

Lab Sample ID: 240-159415-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/11/21 21:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/11/21 21:51*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 17:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 17:38	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 17:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 17:38	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 17:38	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 17:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*62 - 137*		*11/13/21 17:38*	*1*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*		*11/13/21 17:38*	*1*
Toluene-d8 (Surr)	*110*		*78 - 122*		*11/13/21 17:38*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/13/21 17:38*	*1*

Client Sample ID: MW-189S_110321

Date Collected: 11/03/21 11:27
Date Received: 11/05/21 08:00

Lab Sample ID: 240-159415-3

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/11/21 22:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*11/11/21 22:15*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 18:00	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 18:00	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 18:00	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 18:00	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 18:00	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 18:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/13/21 18:00*	*1*
4-Bromofluorobenzene (Surr)	*80*		*56 - 136*		*11/13/21 18:00*	*1*
Toluene-d8 (Surr)	*103*		*78 - 122*		*11/13/21 18:00*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/13/21 18:00*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159415-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159415-1	TRIP BLANK_31	91	74	103	90
240-159415-2	MW-189_110321	95	78	110	96
240-159415-3	MW-189S_110321	99	80	103	98
240-159418-E-2 MS	Matrix Spike	93	87	106	94
240-159418-L-2 MSD	Matrix Spike Duplicate	90	87	107	91
LCS 240-512817/4	Lab Control Sample	90	89	112	90
MB 240-512817/6	Method Blank	98	81	112	98

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159415-2	MW-189_110321	84
240-159415-3	MW-189S_110321	82
240-159418-H-2 MS	Matrix Spike	82
240-159418-P-2 MSD	Matrix Spike Duplicate	83
LCS 240-512585/4	Lab Control Sample	81
MB 240-512585/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512817/6
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 13:55	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 13:55	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:55	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 13:55	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:55	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 13:55	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*		*11/13/21 13:55*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/13/21 13:55*	*1*
Toluene-d8 (Surr)	*112*		*78 - 122*		*11/13/21 13:55*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/13/21 13:55*	*1*

Lab Sample ID: LCS 240-512817/4
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.9		ug/L		109	63 - 134
cis-1,2-Dichloroethene	10.0	10.3		ug/L		103	77 - 123
Tetrachloroethene	10.0	11.9		ug/L		119	76 - 123
trans-1,2-Dichloroethene	10.0	10.8		ug/L		108	75 - 124
Trichloroethene	10.0	9.19		ug/L		92	70 - 122
Vinyl chloride	10.0	9.48		ug/L		95	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*89*		*56 - 136*
Toluene-d8 (Surr)	*112*		*78 - 122*
Dibromofluoromethane (Surr)	*90*		*73 - 120*

Lab Sample ID: 240-159418-E-2 MS
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	10.3		ug/L		103	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.89		ug/L		99	66 - 128
Tetrachloroethene	1.0	U	10.0	9.53		ug/L		95	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.91		ug/L		99	56 - 136
Trichloroethene	1.0	U	10.0	8.16		ug/L		82	61 - 124
Vinyl chloride	1.0	U	10.0	9.96		ug/L		100	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*106*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159418-E-2 MS
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: 240-159418-L-2 MSD
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	10.0		ug/L		100	56 - 135	2	26
cis-1,2-Dichloroethene	1.0	U	10.0	10.1		ug/L		101	66 - 128	2	14
Tetrachloroethene	1.0	U	10.0	10.1		ug/L		101	62 - 131	5	20
trans-1,2-Dichloroethene	1.0	U	10.0	10.1		ug/L		101	56 - 136	2	15
Trichloroethene	1.0	U	10.0	8.61		ug/L		86	61 - 124	5	15
Vinyl chloride	1.0	U	10.0	10.2		ug/L		102	43 - 157	3	24

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*107*		*78 - 122*
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512585/5
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/11/21 19:04	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/11/21 19:04*	*1*

Lab Sample ID: LCS 240-512585/4
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.86		ug/L		99	80 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*

Lab Sample ID: 240-159418-H-2 MS
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	11.1		ug/L		111	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159418-P-2 MSD
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.2		ug/L		102	51 - 153	8	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159415-1

GC/MS VOA

Analysis Batch: 512585

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159415-2	MW-189_110321	Total/NA	Water	8260B SIM	
240-159415-3	MW-189S_110321	Total/NA	Water	8260B SIM	
MB 240-512585/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512585/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159418-H-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159418-P-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 512817

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159415-1	TRIP BLANK_31	Total/NA	Water	8260B	
240-159415-2	MW-189_110321	Total/NA	Water	8260B	
240-159415-3	MW-189S_110321	Total/NA	Water	8260B	
MB 240-512817/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512817/4	Lab Control Sample	Total/NA	Water	8260B	
240-159418-E-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159418-L-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159415-1

Client Sample ID: TRIP BLANK_31

Lab Sample ID: 240-159415-1
Matrix: Water
Date Collected: 11/03/21 00:00
Date Received: 11/05/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512817	11/13/21 17:16	LEE	TAL CAN

Client Sample ID: MW-189_110321

Lab Sample ID: 240-159415-2
Matrix: Water
Date Collected: 11/03/21 10:20
Date Received: 11/05/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512817	11/13/21 17:38	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512585	11/11/21 21:51	CS	TAL CAN

Client Sample ID: MW-189S_110321

Lab Sample ID: 240-159415-3
Matrix: Water
Date Collected: 11/03/21 11:27
Date Received: 11/05/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512817	11/13/21 18:00	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512585	11/11/21 22:15	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159415-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Allyson Hartz	TAT if different from below: ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:	10 day ✓		Lab sampling:
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn/Ac/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_31	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-189_110321	11/3/21	1020		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-189S_110321	11/3/21	1127		X						6					N	G	X	X	X	X	X	X	X	↓

240-159415 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ✓ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Allyson Hartz	Arcadis	11/3/21 1630	Novi Cold Storage	Arcadis	11/3/21 1630
[signature]	ARCADIS	11/3/21 1040	[signature]	ETA	11/4/21 1041
[signature]	ETA	11/4/21 1049	M. [illegible]	ETA	11/5/21 8.00

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11/19/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159415**
Canton Facility

Client ARCADIS Site Name

Cooler unpacked by: Mathew Swna

Cooler Received on 11/5/21 Opened on 11/5/21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: ~~Wet Ice~~ Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.6 °C Corrected Cooler Temp. 0.7 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No	(NA) pH Strip Lot# HC157842
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 0104201G	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes	(No)

11-5-21

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page | Samples processed by:

TB is not logged for SIM due to insufficient volume.
11-5-21

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.

Sample(s) ____ were received in a broken container.

Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.

Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

November 19, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159415-1
Sample date: 2021-11-03
Report received by CADENA: 2021-11-19
Initial Data Verification completed by CADENA: 2021-11-19
Number of Samples:3
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159415-1

		Sample Name:	TRIP BLANK_31				MW-189_110321				MW-189S_110321			
		Lab Sample ID:	2401594151				2401594152				2401594153			
		Sample Date:	11/3/2021				11/3/2021				11/3/2021			
Analyte	Cas No.		Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC														
OSW-8260B														
1,1-Dichloroethene	75-35-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim														
1,4-Dioxane	123-91-1						ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

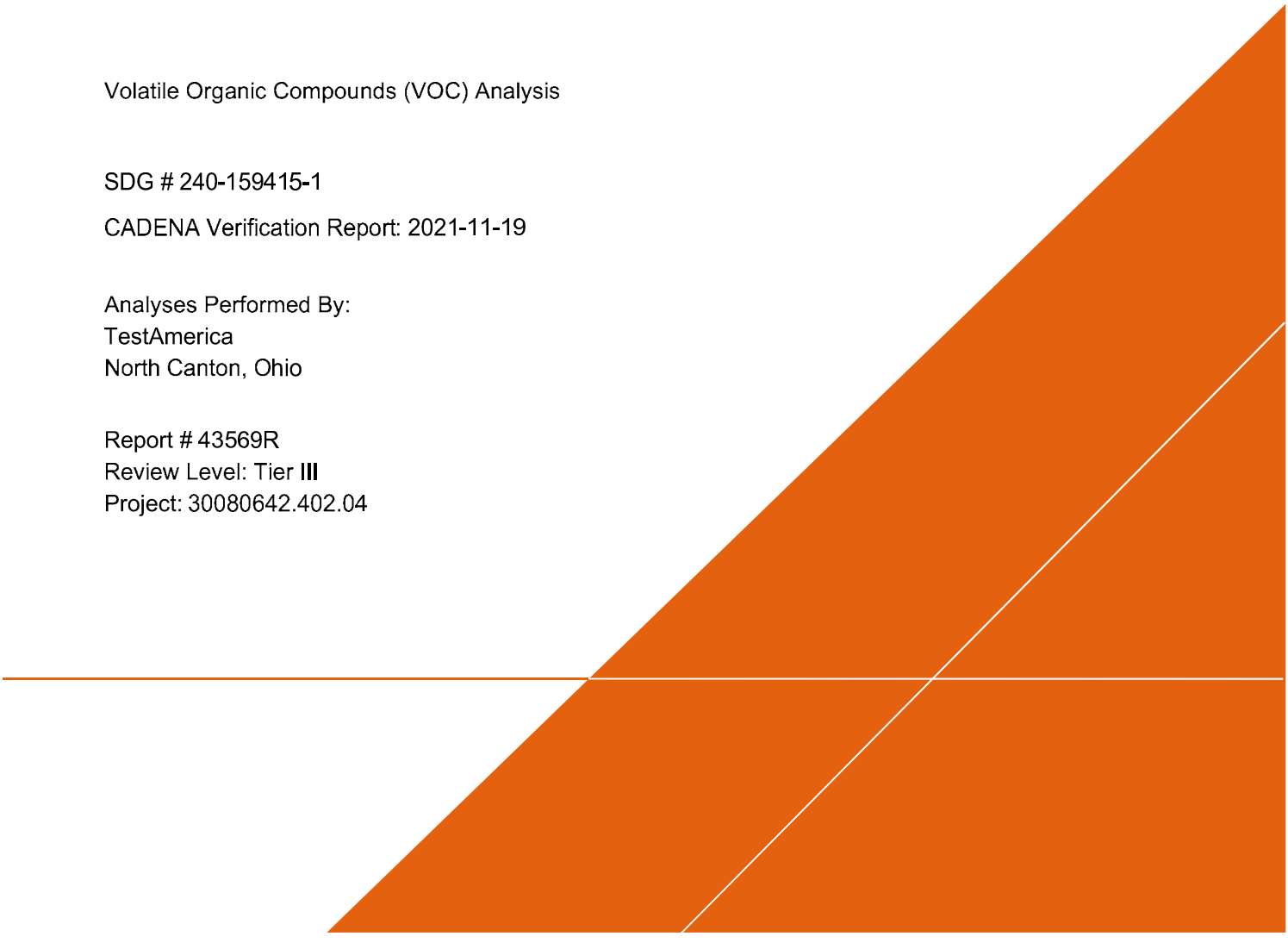
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159415-1

CADENA Verification Report: 2021-11-19

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43569R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159415-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_31	240-159415-1	Water	11/03/21		X	
MW-189_110321	240-159415-2	Water	11/03/21		X	X
MW-189S_110321	240-159415-3	Water	11/03/21		X	X

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.
  - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
  - E The compound was quantitated above the calibration range.
  - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
  - J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
  - UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
  - J+ The result is an estimated quantity, but the result may be biased high.
  - J- The result is an estimated quantity, but the result may be biased low.
  - UB Analyte considered non-detect at the listed value due to associated blank contamination.
  - N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
  - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE: 

DATE: December 07, 2021

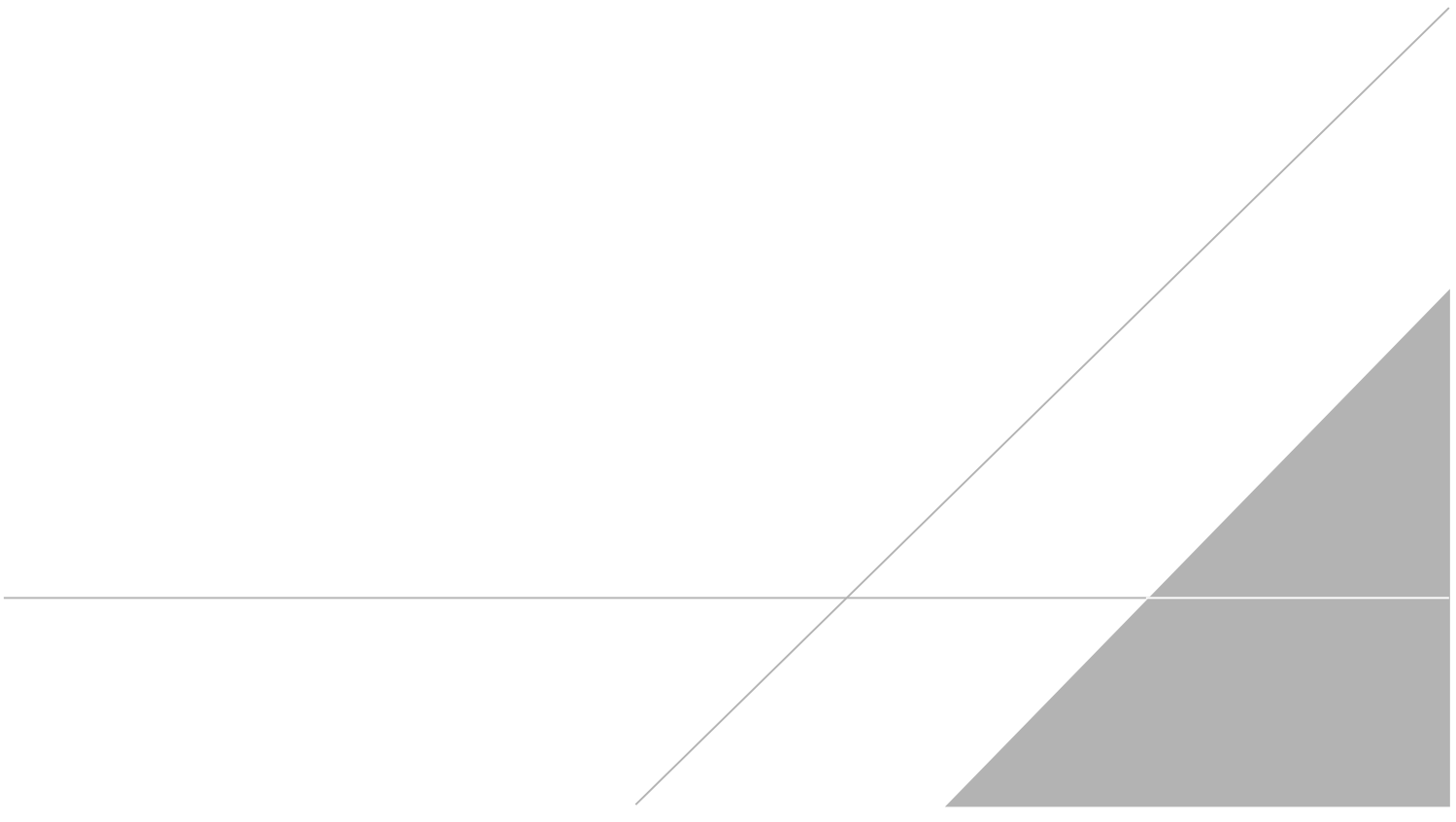
PEER REVIEW: Andrew Korycinski

DATE: December 8, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



MICHIGAN 190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Allyson Hartz	TAT if different from below: ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:	10 day ✓		Lab sampling:
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn/Ac/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_31	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-189_110321	11/3/21	1020		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-189S_110321	11/3/21	1127		X						6					N	G	X	X	X	X	X	X	X	↓

240-159415 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ✓ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Allyson Hartz	Arcadis	11/3/21 1630	Novi Cold Storage	Arcadis	11/3/21 1630
[signature]	ARCADIS	11/3/21 1040	[signature]	ETA	11/4/21 1041
[signature]	ETA	11/4/21 1049	M. [illegible]	ETA	11/5/21 8.00

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11/19/2021

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159415-1

Client Sample ID: TRIP BLANK_31
Date Collected: 11/03/21 00:00
Date Received: 11/05/21 08:00

Lab Sample ID: 240-159415-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 17:16	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 17:16	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 17:16	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 17:16	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 17:16	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 17:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*62 - 137*		*11/13/21 17:16*	*1*
4-Bromofluorobenzene (Surr)	*74*		*56 - 136*		*11/13/21 17:16*	*1*
Toluene-d8 (Surr)	*103*		*78 - 122*		*11/13/21 17:16*	*1*
Dibromofluoromethane (Surr)	*90*		*73 - 120*		*11/13/21 17:16*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159415-1

Client Sample ID: MW-189_110321

Date Collected: 11/03/21 10:20
Date Received: 11/05/21 08:00

Lab Sample ID: 240-159415-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/11/21 21:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/11/21 21:51*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 17:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 17:38	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 17:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 17:38	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 17:38	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 17:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*62 - 137*		*11/13/21 17:38*	*1*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*		*11/13/21 17:38*	*1*
Toluene-d8 (Surr)	*110*		*78 - 122*		*11/13/21 17:38*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/13/21 17:38*	*1*

Client Sample ID: MW-189S_110321

Date Collected: 11/03/21 11:27
Date Received: 11/05/21 08:00

Lab Sample ID: 240-159415-3

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/11/21 22:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*11/11/21 22:15*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 18:00	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 18:00	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 18:00	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 18:00	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 18:00	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 18:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/13/21 18:00*	*1*
4-Bromofluorobenzene (Surr)	*80*		*56 - 136*		*11/13/21 18:00*	*1*
Toluene-d8 (Surr)	*103*		*78 - 122*		*11/13/21 18:00*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/13/21 18:00*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159138-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/17/2021 10:51:19 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

Job ID: 240-159138-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159138-1

Comments
No additional comments.

Receipt
The samples were received on 11/3/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.2º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159138-1	TRIP BLANK_15	Water	11/01/21 00:00	11/03/21 08:00
240-159138-2	MW-204S_110121	Water	11/01/21 12:21	11/03/21 08:00
240-159138-3	MW-204_110121	Water	11/01/21 13:26	11/03/21 08:00
240-159138-4	MW-205S_110121	Water	11/01/21 15:36	11/03/21 08:00
240-159138-5	MW-205_110121	Water	11/01/21 16:56	11/03/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

Client Sample ID: TRIP BLANK_15 — Lab Sample ID: 240-159138-1

No Detections.

Client Sample ID: MW-204S_110121 — Lab Sample ID: 240-159138-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	2.7		1.0	0.46	ug/L	1		8260B	Total/NA
Trichloroethene	7.4		1.0	0.44	ug/L	1		8260B	Total/NA

Client Sample ID: MW-204_110121 — Lab Sample ID: 240-159138-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Trichloroethene	51		2.5	1.1	ug/L	2.5		8260B	Total/NA

Client Sample ID: MW-205S_110121 — Lab Sample ID: 240-159138-4

No Detections.

Client Sample ID: MW-205_110121 — Lab Sample ID: 240-159138-5

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

Client Sample ID: TRIP BLANK_15
Date Collected: 11/01/21 00:00
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159138-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 04:04	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 04:04	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 04:04	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 04:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*11/11/21 04:04*	*1*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*		*11/11/21 04:04*	*1*
Toluene-d8 (Surr)	*110*		*78 - 122*		*11/11/21 04:04*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/11/21 04:04*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

Client Sample ID: MW-204S_110121
Date Collected: 11/01/21 12:21
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159138-2
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	**2.7**		1.0	0.46	ug/L			11/12/21 12:20	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 12:20	1
Trichloroethene	**7.4**		1.0	0.44	ug/L			11/12/21 12:20	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 12:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/12/21 12:20*	*1*
4-Bromofluorobenzene (Surr)	*77*		*56 - 136*		*11/12/21 12:20*	*1*
Toluene-d8 (Surr)	*105*		*78 - 122*		*11/12/21 12:20*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*11/12/21 12:20*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

Client Sample ID: MW-204_110121
Date Collected: 11/01/21 13:26
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159138-3
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	2.5	U	2.5	1.2	ug/L			11/11/21 19:22	2.5
trans-1,2-Dichloroethene	2.5	U	2.5	1.3	ug/L			11/11/21 19:22	2.5
Trichloroethene	**51**		2.5	1.1	ug/L			11/11/21 19:22	2.5
Vinyl chloride	2.5	U	2.5	1.1	ug/L			11/11/21 19:22	2.5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/11/21 19:22*	*2.5*
4-Bromofluorobenzene (Surr)	*75*		*56 - 136*		*11/11/21 19:22*	*2.5*
Toluene-d8 (Surr)	*104*		*78 - 122*		*11/11/21 19:22*	*2.5*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*11/11/21 19:22*	*2.5*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

Client Sample ID: MW-205S_110121
Date Collected: 11/01/21 15:36
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159138-4
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 04:26	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 04:26	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 04:26	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 04:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*11/11/21 04:26*	*1*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*		*11/11/21 04:26*	*1*
Toluene-d8 (Surr)	*105*		*78 - 122*		*11/11/21 04:26*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/11/21 04:26*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

Client Sample ID: MW-205_110121
Date Collected: 11/01/21 16:56
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159138-5
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 04:48	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 04:48	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 04:48	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 04:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*62 - 137*		*11/11/21 04:48*	*1*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*		*11/11/21 04:48*	*1*
Toluene-d8 (Surr)	*102*		*78 - 122*		*11/11/21 04:48*	*1*
Dibromofluoromethane (Surr)	*90*		*73 - 120*		*11/11/21 04:48*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159138-1	TRIP BLANK_15	96	85	110	94
240-159138-2	MW-204S_110121	93	77	105	92
240-159138-3	MW-204_110121	93	75	104	95
240-159138-4	MW-205S_110121	96	78	105	96
240-159138-5	MW-205_110121	91	78	102	90
240-159143-E-3 MSD	Matrix Spike Duplicate	94	97	117	95
240-159143-H-3 MS	Matrix Spike	90	88	108	92
240-159185-C-26 MS	Matrix Spike	89	83	111	87
240-159185-C-26 MSD	Matrix Spike Duplicate	92	90	109	90
240-159556-B-7 MS	Matrix Spike	92	88	106	91
240-159556-B-7 MSD	Matrix Spike Duplicate	90	84	109	93
LCS 240-512327/4	Lab Control Sample	88	84	107	90
LCS 240-512497/4	Lab Control Sample	93	93	113	95
LCS 240-512676/4	Lab Control Sample	94	90	112	95
MB 240-512327/6	Method Blank	92	78	103	91
MB 240-512497/6	Method Blank	94	82	109	92
MB 240-512676/6	Method Blank	97	83	111	96

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512327/6
Matrix: Water
Analysis Batch: 512327

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	0.541	J	1.0	0.46	ug/L			11/10/21 23:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/10/21 23:58	1
Trichloroethene	0.468	J	1.0	0.44	ug/L			11/10/21 23:58	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/10/21 23:58	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/10/21 23:58*	*1*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*		*11/10/21 23:58*	*1*
Toluene-d8 (Surr)	*103*		*78 - 122*		*11/10/21 23:58*	*1*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*11/10/21 23:58*	*1*

Lab Sample ID: LCS 240-512327/4
Matrix: Water
Analysis Batch: 512327

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,2-Dichloroethene	10.0	10.7		ug/L		107	77 - 123
trans-1,2-Dichloroethene	10.0	10.0		ug/L		100	75 - 124
Trichloroethene	10.0	9.37		ug/L		94	70 - 122
Vinyl chloride	10.0	8.92		ug/L		89	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*62 - 137*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*
Toluene-d8 (Surr)	*107*		*78 - 122*
Dibromofluoromethane (Surr)	*90*		*73 - 120*

Lab Sample ID: 240-159143-E-3 MSD
Matrix: Water
Analysis Batch: 512327

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
cis-1,2-Dichloroethene	1.0	U	10.0	9.70		ug/L		97	66 - 128	4	14
trans-1,2-Dichloroethene	1.0	U	10.0	9.34		ug/L		93	56 - 136	4	15
Trichloroethene	1.0	U	10.0	7.92		ug/L		79	61 - 124	6	15
Vinyl chloride	1.0	U	10.0	10.1		ug/L		101	43 - 157	6	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*94*		*62 - 137*
4-Bromofluorobenzene (Surr)	*97*		*56 - 136*
Toluene-d8 (Surr)	*117*		*78 - 122*
Dibromofluoromethane (Surr)	*95*		*73 - 120*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159143-H-3 MS
Matrix: Water
Analysis Batch: 512327

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,2-Dichloroethene	1.0	U	10.0	9.36		ug/L		94	66 - 128
trans-1,2-Dichloroethene	1.0	U	10.0	8.94		ug/L		89	56 - 136
Trichloroethene	1.0	U	10.0	7.46		ug/L		75	61 - 124
Vinyl chloride	1.0	U	10.0	9.56		ug/L		96	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*88*		*56 - 136*
Toluene-d8 (Surr)	*108*		*78 - 122*
Dibromofluoromethane (Surr)	*92*		*73 - 120*

Lab Sample ID: MB 240-512497/6
Matrix: Water
Analysis Batch: 512497

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 12:17	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 12:17	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 12:17	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 12:17	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*62 - 137*		*11/11/21 12:17*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/11/21 12:17*	*1*
Toluene-d8 (Surr)	*109*		*78 - 122*		*11/11/21 12:17*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*11/11/21 12:17*	*1*

Lab Sample ID: LCS 240-512497/4
Matrix: Water
Analysis Batch: 512497

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,2-Dichloroethene	10.0	11.1		ug/L		111	77 - 123
trans-1,2-Dichloroethene	10.0	10.8		ug/L		108	75 - 124
Trichloroethene	10.0	9.47		ug/L		95	70 - 122
Vinyl chloride	10.0	10.1		ug/L		101	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*93*		*56 - 136*
Toluene-d8 (Surr)	*113*		*78 - 122*
Dibromofluoromethane (Surr)	*95*		*73 - 120*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159185-C-26 MS
Matrix: Water
Analysis Batch: 512497

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
cis-1,2-Dichloroethene	7100		3330	9520		ug/L		72	66 - 128		
trans-1,2-Dichloroethene	330	U	3330	2870		ug/L		86	56 - 136		
Trichloroethene	8300	F1	3330	10000	F1	ug/L		51	61 - 124		
Vinyl chloride	330	U	3330	2880		ug/L		86	43 - 157		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*62 - 137*
4-Bromofluorobenzene (Surr)	*83*		*56 - 136*
Toluene-d8 (Surr)	*111*		*78 - 122*
Dibromofluoromethane (Surr)	*87*		*73 - 120*

Lab Sample ID: 240-159185-C-26 MSD
Matrix: Water
Analysis Batch: 512497

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
cis-1,2-Dichloroethene	7100		3330	10100		ug/L		90	66 - 128	6	14
trans-1,2-Dichloroethene	330	U	3330	3270		ug/L		98	56 - 136	13	15
Trichloroethene	8300	F1	3330	10700		ug/L		71	61 - 124	6	15
Vinyl chloride	330	U	3330	3410		ug/L		102	43 - 157	17	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*
4-Bromofluorobenzene (Surr)	*90*		*56 - 136*
Toluene-d8 (Surr)	*109*		*78 - 122*
Dibromofluoromethane (Surr)	*90*		*73 - 120*

Lab Sample ID: MB 240-512676/6
Matrix: Water
Analysis Batch: 512676

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 11:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 11:58	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 11:58	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 11:58	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*62 - 137*		*11/12/21 11:58*	*1*
4-Bromofluorobenzene (Surr)	*83*		*56 - 136*		*11/12/21 11:58*	*1*
Toluene-d8 (Surr)	*111*		*78 - 122*		*11/12/21 11:58*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/12/21 11:58*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-512676/4
Matrix: Water
Analysis Batch: 512676

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
cis-1,2-Dichloroethene			10.0	10.3		ug/L		103	77 - 123		
trans-1,2-Dichloroethene			10.0	10.4		ug/L		104	75 - 124		
Trichloroethene			10.0	9.00		ug/L		90	70 - 122		
Vinyl chloride			10.0	10.0		ug/L		100	60 - 144		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*94*		*62 - 137*
4-Bromofluorobenzene (Surr)	*90*		*56 - 136*
Toluene-d8 (Surr)	*112*		*78 - 122*
Dibromofluoromethane (Surr)	*95*		*73 - 120*

Lab Sample ID: 240-159556-B-7 MS
Matrix: Water
Analysis Batch: 512676

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
cis-1,2-Dichloroethene	10	U	100	94.5		ug/L		94	66 - 128		
trans-1,2-Dichloroethene	10	U	100	95.2		ug/L		95	56 - 136		
Trichloroethene	10	U	100	78.2		ug/L		78	61 - 124		
Vinyl chloride	10	U	100	89.4		ug/L		89	43 - 157		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*
4-Bromofluorobenzene (Surr)	*88*		*56 - 136*
Toluene-d8 (Surr)	*106*		*78 - 122*
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Lab Sample ID: 240-159556-B-7 MSD
Matrix: Water
Analysis Batch: 512676

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
cis-1,2-Dichloroethene	10	U	100	102		ug/L		102	66 - 128	8	14
trans-1,2-Dichloroethene	10	U	100	103		ug/L		103	56 - 136	8	15
Trichloroethene	10	U	100	87.1		ug/L		87	61 - 124	11	15
Vinyl chloride	10	U	100	103		ug/L		103	43 - 157	15	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*
Toluene-d8 (Surr)	*109*		*78 - 122*
Dibromofluoromethane (Surr)	*93*		*73 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

GC/MS VOA

Analysis Batch: 512327

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159138-1	TRIP BLANK_15	Total/NA	Water	8260B	
240-159138-4	MW-205S_110121	Total/NA	Water	8260B	
240-159138-5	MW-205_110121	Total/NA	Water	8260B	
MB 240-512327/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512327/4	Lab Control Sample	Total/NA	Water	8260B	
240-159143-E-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	
240-159143-H-3 MS	Matrix Spike	Total/NA	Water	8260B	

Analysis Batch: 512497

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159138-3	MW-204_110121	Total/NA	Water	8260B	
MB 240-512497/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512497/4	Lab Control Sample	Total/NA	Water	8260B	
240-159185-C-26 MS	Matrix Spike	Total/NA	Water	8260B	
240-159185-C-26 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 512676

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159138-2	MW-204S_110121	Total/NA	Water	8260B	
MB 240-512676/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512676/4	Lab Control Sample	Total/NA	Water	8260B	
240-159556-B-7 MS	Matrix Spike	Total/NA	Water	8260B	
240-159556-B-7 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

Client Sample ID: TRIP BLANK_15
Lab Sample ID: 240-159138-1
Date Collected: 11/01/21 00:00
Matrix: Water
Date Received: 11/03/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512327	11/11/21 04:04	LEE	TAL CAN

Client Sample ID: MW-204S_110121
Lab Sample ID: 240-159138-2
Date Collected: 11/01/21 12:21
Matrix: Water
Date Received: 11/03/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512676	11/12/21 12:20	LEE	TAL CAN

Client Sample ID: MW-204_110121
Lab Sample ID: 240-159138-3
Date Collected: 11/01/21 13:26
Matrix: Water
Date Received: 11/03/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		2.5	512497	11/11/21 19:22	LEE	TAL CAN

Client Sample ID: MW-205S_110121
Lab Sample ID: 240-159138-4
Date Collected: 11/01/21 15:36
Matrix: Water
Date Received: 11/03/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512327	11/11/21 04:26	LEE	TAL CAN

Client Sample ID: MW-205_110121
Lab Sample ID: 240-159138-5
Date Collected: 11/01/21 16:56
Matrix: Water
Date Received: 11/03/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512327	11/11/21 04:48	LEE	TAL CAN

Laboratory References:
TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN
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Chain of Custody Record

11/02

TestAmerica

TestAmerica Laboratory location: Brighton 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Gary Schafer	TAT if different from below: 10 day (✓) 2 weeks; 3 weeks; 1 week; 2 days; 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y/N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_15		---		X						1					N	G	X	X	X	X	X	X		1 Trip Blank
MW-2045_110121	11/01/21	1221		X						3					N	G		X	X		X	X		3 VOAs for 8260B; ~~3 VOAs for 8260B SIM~~ 11/2/21
MW-204_110121	11/01/21	1326		X						3					N	G		X	X		X	X		
MW-2055_110121	11/01/21	1536		X						3					N	G		X	X		X	X		
MW-205_110121	11/01/21	1656		X						3					N	G		X	X		X	X		

240-159138 Chain of Custody

Possible Hazard Identification: (✓) Non-Hazard; Flammable; Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; (✓) Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomaria@cadenaacc.com Cadena #E203631
Level IV Reporting requested

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
Gary Schafer	Arcadis	11/1/21 1755	NOVI cold storage	Arcadis	11/1/21 1755
Julia McClafferty	Arcadis	11/2/21 1250		GTA	11/2/21 1250
	GTA	11/2/21 1251	Laboratory by:	ETA	11/3/21 8 WAM

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11/17/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159138**
Canton Facility

Client ARCADIS Site Name

Cooler Received on 11/3/21 Opened on 11/3/21

Cooler unpacked by: Matthew Sunga

FedEx 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used. (Bubble Wrap) Foam Plastic Bag None Other

COOLANT (Wet Ice) Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp 0.1 °C Corrected Cooler Temp 0.2 °C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp °C

2 Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No

Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA

-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)

-Were tamper/custody seals intact and uncompromised? (Yes) No NA

3 Shippers' packing slip attached to the cooler(s)? Yes (No)

4 Did custody papers accompany the sample(s)? (Yes) No

5 Were the custody papers relinquished & signed in the appropriate place? (Yes) No

6 Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No

7 Did all bottles arrive in good condition (Unbroken)? (Yes) No

8 Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No

9 For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?

10 Were correct bottle(s) used for the test(s) indicated? (Yes) No

11 Sufficient quantity received to perform indicated analyses? (Yes) No

12 Are these work share samples and all listed on the COC? Yes (No)

If yes, Questions 13-17 have been checked at the originating laboratory

13 Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# **HC157842**

14 Were VOAs on the COC? (Yes) No

15 Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA

16 Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 010420 16 (Yes) No

17 Was a LL Hg or Me Hg trip blank present? Yes (No)

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18 CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19 SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.

Sample(s) were received in a broken container

Sample(s) were received with bubble >6 mm in diameter (Notify PM)

20 SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory

Time preserved Preservative(s) added/Lot number(s)

VOA Sample Preservation Date/Time VOAs Frozen

WI NC-099

DATA VERIFICATION REPORT

November 17, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159138-1
Sample date: 2021-11-01
Report received by CADENA: 2021-11-17
Initial Data Verification completed by CADENA: 2021-11-17
Number of Samples:5
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 512327 method blank had detections below the RL for the following analytes: CIS-1,2-DICHLOROETHENE and TRICHLOROETHENE. Qualification of client sample results was not required based on these method blank detections.

GCMS QC batch MS/MSD recovery outliers were not determined using a client sample so qualification was not required based on these sample-specific QC outliers.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159138-1

		Sample Name:	TRIP BLANK_15				MW-204S_110121				MW-204_110121				MW-205S_110121				MW-205_110121			
		Lab Sample ID:	2401591381				2401591382				2401591383				2401591384				2401591385			
		Sample Date:	11/1/2021				11/1/2021				11/1/2021				11/1/2021				11/1/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC																					
OSW-8260B																					
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	2.7	1.0	ug/l	---	ND	2.5	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	2.5	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	7.4	1.0	ug/l	---	51	2.5	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	2.5	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

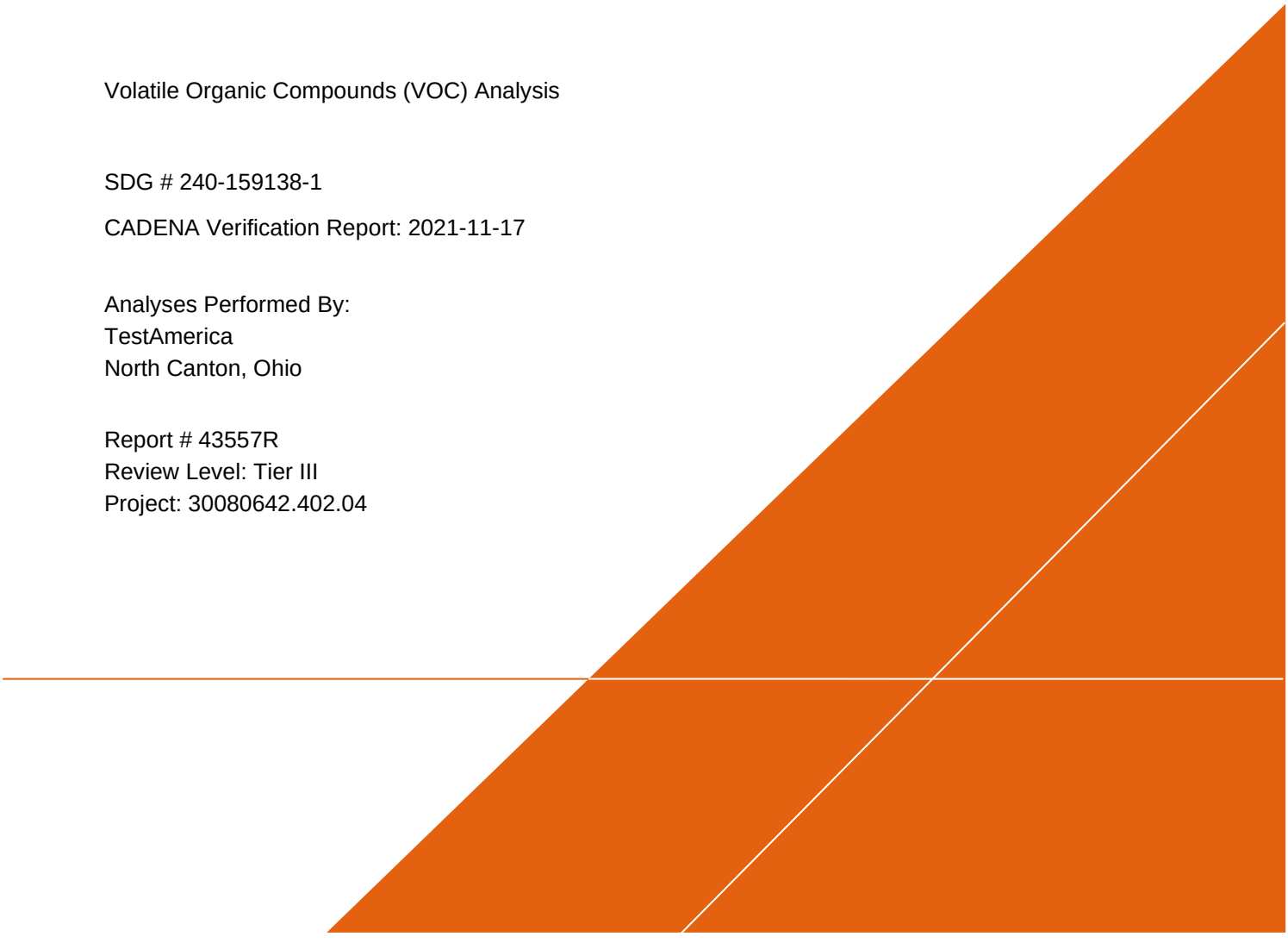
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159138-1

CADENA Verification Report: 2021-11-17

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43557R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159138-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					VOC
TRIP BLANK_15	240-159138-1	Water	11/01/2021		X
MW-204S_110121	240-159138-2	Water	11/01/2021		X
MW-204_110121	240-159138-3	Water	11/01/2021		X
MW-205S_110121	240-159138-4	Water	11/01/2021		X
MW-205_110121	240-159138-5	Water	11/01/2021		X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE:

DATE: December 02, 2021

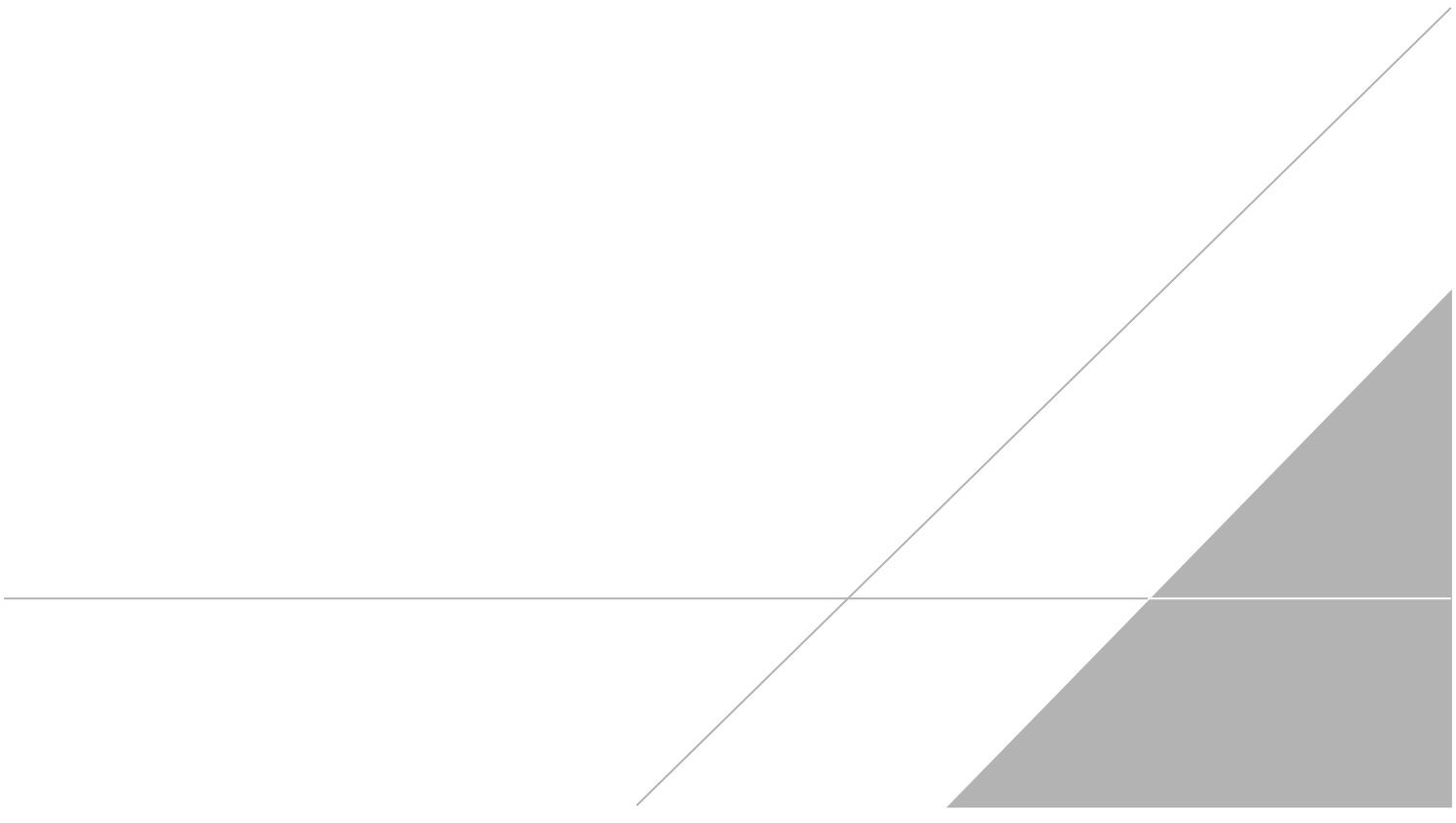
PEER REVIEW: Andrew Korycinski

DATE: December 2, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



MICHIGAN
190

Chain of Custody Record

0.1/0.2

TestAmerica

TestAmerica Laboratory location Brighton 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Gary Schafer	TAT if different from below: 10 day; 3 weeks; 2 weeks; 1 week; 2 days; 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y/N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_15		---		X						1					N	G	~~X~~	X	X	~~X~~	X	X	~~X~~	1 Trip Blank
MW-2045_110121	11/01/21	1221		X						3					N	G		X	X		X	X		3 VOAs for 8260B ~~3 VOAs for 8260B SIM~~ 11/2/21
MW-204_110121	11/01/21	1326		X						3					N	G		X	X		X	X		
MW-2055_110121	11/01/21	1536		X						3					N	G		X	X		X	X		
MW-205_110121	11/01/21	1656		X						3					N	G		X	X		X	X		

240-159138 Chain of Custody

Possible Hazard Identification
Non-Hazard Flammable Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Return to Client Disposal By Lab Archive For Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomaria@cadenaacc.com Cadena #E203631
Level IV Reporting requested

	Company	Date/Time		Company	Date/Time
Relinquished by: Gary Schafer	Arcadis	11/1/21	1755	Received by: NOVI cold storage	Arcadis	11/1/21	1755
Relinquished by: Julia McClafferty	Arcadis	11/2/21	1250	Received by:	GTA	11/2/21	1250
Relinquished by:	GTA	11/2/21	1751	Received in Laboratory by:	ETA	11/3/21	8 WAM

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11/17/2021

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

Client Sample ID: TRIP BLANK_15
Date Collected: 11/01/21 00:00
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159138-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 04:04	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 04:04	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 04:04	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 04:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*11/11/21 04:04*	*1*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*		*11/11/21 04:04*	*1*
Toluene-d8 (Surr)	*110*		*78 - 122*		*11/11/21 04:04*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/11/21 04:04*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

Client Sample ID: MW-204S_110121
Date Collected: 11/01/21 12:21
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159138-2
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	**2.7**		1.0	0.46	ug/L			11/12/21 12:20	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 12:20	1
Trichloroethene	**7.4**		1.0	0.44	ug/L			11/12/21 12:20	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 12:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/12/21 12:20*	*1*
4-Bromofluorobenzene (Surr)	*77*		*56 - 136*		*11/12/21 12:20*	*1*
Toluene-d8 (Surr)	*105*		*78 - 122*		*11/12/21 12:20*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*11/12/21 12:20*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

Client Sample ID: MW-204_110121
Date Collected: 11/01/21 13:26
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159138-3
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	2.5	U	2.5	1.2	ug/L			11/11/21 19:22	2.5
trans-1,2-Dichloroethene	2.5	U	2.5	1.3	ug/L			11/11/21 19:22	2.5
Trichloroethene	**51**		2.5	1.1	ug/L			11/11/21 19:22	2.5
Vinyl chloride	2.5	U	2.5	1.1	ug/L			11/11/21 19:22	2.5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/11/21 19:22*	*2.5*
4-Bromofluorobenzene (Surr)	*75*		*56 - 136*		*11/11/21 19:22*	*2.5*
Toluene-d8 (Surr)	*104*		*78 - 122*		*11/11/21 19:22*	*2.5*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*11/11/21 19:22*	*2.5*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

Client Sample ID: MW-205S_110121
Date Collected: 11/01/21 15:36
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159138-4
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 04:26	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 04:26	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 04:26	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 04:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*11/11/21 04:26*	*1*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*		*11/11/21 04:26*	*1*
Toluene-d8 (Surr)	*105*		*78 - 122*		*11/11/21 04:26*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/11/21 04:26*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159138-1

Client Sample ID: MW-205_110121
Date Collected: 11/01/21 16:56
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159138-5
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 04:48	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 04:48	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 04:48	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 04:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*62 - 137*		*11/11/21 04:48*	*1*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*		*11/11/21 04:48*	*1*
Toluene-d8 (Surr)	*102*		*78 - 122*		*11/11/21 04:48*	*1*
Dibromofluoromethane (Surr)	*90*		*73 - 120*		*11/11/21 04:48*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159539-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/22/2021 10:21:23 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159539-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159539-1

Comments
No additional comments.

Receipt
The samples were received on 11/6/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.4º C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) for analytical batch 512679 exceeded control criteria for one or multiple compounds. The samples associated with this CCV were non-detect for the affected analytes. In accordance with the laboratory SOP, a low level CCV at the reporting limit (labeled as an MRL) was analyzed and the affected compounds were detected; therefore the data has been reported. No further corrective action was required: TRIP BLANK_16 (240-159539-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159539-1	TRIP BLANK_16	Water	11/02/21 00:00	11/06/21 08:00
240-159539-2	MW-202S_110221	Water	11/02/21 12:31	11/06/21 08:00
240-159539-3	MW-202_110221	Water	11/02/21 13:46	11/06/21 08:00
240-159539-4	MW-203S_110221	Water	11/02/21 18:16	11/06/21 08:00
240-159539-5	MW-203_110221	Water	11/02/21 19:16	11/06/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

Client Sample ID: TRIP BLANK_16 — Lab Sample ID: 240-159539-1

No Detections.

Client Sample ID: MW-202S_110221 — Lab Sample ID: 240-159539-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Trichloroethene	0.52	J	1.0	0.44	ug/L	1		8260B	Total/NA

Client Sample ID: MW-202_110221 — Lab Sample ID: 240-159539-3

No Detections.

Client Sample ID: MW-203S_110221 — Lab Sample ID: 240-159539-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
trans-1,2-Dichloroethene	0.82	J	1.0	0.51	ug/L	1		8260B	Total/NA
Trichloroethene	18		1.0	0.44	ug/L	1		8260B	Total/NA

Client Sample ID: MW-203_110221 — Lab Sample ID: 240-159539-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	43		25	12	ug/L	25		8260B	Total/NA
trans-1,2-Dichloroethene	86		25	13	ug/L	25		8260B	Total/NA
Trichloroethene	830	F1	25	11	ug/L	25		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

Client Sample ID: TRIP BLANK_16
Date Collected: 11/02/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159539-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 16:45	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 16:45	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 16:45	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 16:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*126*		*62 - 137*		*11/12/21 16:45*	*1*
4-Bromofluorobenzene (Surr)	*66*		*56 - 136*		*11/12/21 16:45*	*1*
Toluene-d8 (Surr)	*87*		*78 - 122*		*11/12/21 16:45*	*1*
Dibromofluoromethane (Surr)	*111*		*73 - 120*		*11/12/21 16:45*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

Client Sample ID: MW-202S_110221
Date Collected: 11/02/21 12:31
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159539-2
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 06:31	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 06:31	1
Trichloroethene	**0.52**	**J**	1.0	0.44	ug/L			11/12/21 06:31	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 06:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*62 - 137*		*11/12/21 06:31*	*1*
4-Bromofluorobenzene (Surr)	*69*		*56 - 136*		*11/12/21 06:31*	*1*
Toluene-d8 (Surr)	*104*		*78 - 122*		*11/12/21 06:31*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*11/12/21 06:31*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

Client Sample ID: MW-202_110221
Date Collected: 11/02/21 13:46
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159539-3
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 06:53	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 06:53	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 06:53	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 06:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*11/12/21 06:53*	*1*
4-Bromofluorobenzene (Surr)	*75*		*56 - 136*		*11/12/21 06:53*	*1*
Toluene-d8 (Surr)	*106*		*78 - 122*		*11/12/21 06:53*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/12/21 06:53*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

Client Sample ID: MW-203S_110221
Date Collected: 11/02/21 18:16
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159539-4
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 07:16	1
trans-1,2-Dichloroethene	**0.82**	**J**	1.0	0.51	ug/L			11/12/21 07:16	1
Trichloroethene	**18**		1.0	0.44	ug/L			11/12/21 07:16	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 07:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*62 - 137*		*11/12/21 07:16*	*1*
4-Bromofluorobenzene (Surr)	*77*		*56 - 136*		*11/12/21 07:16*	*1*
Toluene-d8 (Surr)	*113*		*78 - 122*		*11/12/21 07:16*	*1*
Dibromofluoromethane (Surr)	*97*		*73 - 120*		*11/12/21 07:16*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

Client Sample ID: MW-203_110221
Date Collected: 11/02/21 19:16
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159539-5
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	**43**		25	12	ug/L			11/12/21 07:38	25
trans-1,2-Dichloroethene	**86**		25	13	ug/L			11/12/21 07:38	25
Trichloroethene	**830**	**F1**	25	11	ug/L			11/12/21 07:38	25
Vinyl chloride	25	U	25	11	ug/L			11/12/21 07:38	25

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*		*11/12/21 07:38*	*25*
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*11/12/21 07:38*	*25*
Toluene-d8 (Surr)	*103*		*78 - 122*		*11/12/21 07:38*	*25*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*11/12/21 07:38*	*25*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159539-1	TRIP BLANK_16	126	66	87	111
240-159539-2	MW-202S_110221	91	69	104	92
240-159539-3	MW-202_110221	96	75	106	96
240-159539-4	MW-203S_110221	97	77	113	97
240-159539-5	MW-203_110221	90	73	103	91
240-159539-5 MS	MW-203_110221	96	94	116	97
240-159539-5 MSD	MW-203_110221	90	87	108	92
240-159556-B-5 MS	Matrix Spike	105	94	102	98
240-159556-B-5 MSD	Matrix Spike Duplicate	102	98	100	92
LCS 240-512565/4	Lab Control Sample	89	87	107	90
LCS 240-512679/4	Lab Control Sample	100	99	99	89
MB 240-512565/6	Method Blank	92	73	102	90
MB 240-512679/7	Method Blank	117	69	91	103

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512565/6
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 23:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 23:50	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 23:50	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 23:50	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/11/21 23:50*	*1*
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*11/11/21 23:50*	*1*
Toluene-d8 (Surr)	*102*		*78 - 122*		*11/11/21 23:50*	*1*
Dibromofluoromethane (Surr)	*90*		*73 - 120*		*11/11/21 23:50*	*1*

Lab Sample ID: LCS 240-512565/4
Matrix: Water
Analysis Batch: 512565

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,2-Dichloroethene	10.0	10.1		ug/L		101	77 - 123
trans-1,2-Dichloroethene	10.0	10.1		ug/L		101	75 - 124
Trichloroethene	10.0	8.95		ug/L		90	70 - 122
Vinyl chloride	10.0	9.56		ug/L		96	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*107*		*78 - 122*
Dibromofluoromethane (Surr)	*90*		*73 - 120*

Lab Sample ID: 240-159539-5 MS
Matrix: Water
Analysis Batch: 512565

Client Sample ID: MW-203_110221
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,2-Dichloroethene	43		250	285		ug/L		97	66 - 128
trans-1,2-Dichloroethene	86		250	316		ug/L		92	56 - 136
Trichloroethene	830	F1	250	936	F1	ug/L		41	61 - 124
Vinyl chloride	25	U	250	246		ug/L		99	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*
Toluene-d8 (Surr)	*116*		*78 - 122*
Dibromofluoromethane (Surr)	*97*		*73 - 120*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159539-5 MSD
Matrix: Water
Analysis Batch: 512565

Client Sample ID: MW-203_110221
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
cis-1,2-Dichloroethene	43		250	272		ug/L		92	66 - 128	5	14
trans-1,2-Dichloroethene	86		250	297		ug/L		84	56 - 136	6	15
Trichloroethene	830	F1	250	885	F1	ug/L		21	61 - 124	6	15
Vinyl chloride	25	U	250	233		ug/L		93	43 - 157	6	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*108*		*78 - 122*
Dibromofluoromethane (Surr)	*92*		*73 - 120*

Lab Sample ID: MB 240-512679/7
Matrix: Water
Analysis Batch: 512679

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 12:01	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 12:01	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 12:01	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 12:01	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*62 - 137*		*11/12/21 12:01*	*1*
4-Bromofluorobenzene (Surr)	*69*		*56 - 136*		*11/12/21 12:01*	*1*
Toluene-d8 (Surr)	*91*		*78 - 122*		*11/12/21 12:01*	*1*
Dibromofluoromethane (Surr)	*103*		*73 - 120*		*11/12/21 12:01*	*1*

Lab Sample ID: LCS 240-512679/4
Matrix: Water
Analysis Batch: 512679

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,2-Dichloroethene	10.0	10.3		ug/L		103	77 - 123
trans-1,2-Dichloroethene	10.0	10.4		ug/L		104	75 - 124
Trichloroethene	10.0	8.95		ug/L		89	70 - 122
Vinyl chloride	10.0	7.65		ug/L		77	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*99*		*56 - 136*
Toluene-d8 (Surr)	*99*		*78 - 122*
Dibromofluoromethane (Surr)	*89*		*73 - 120*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159556-B-5 MS
Matrix: Water
Analysis Batch: 512679

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,2-Dichloroethene	20	U	200	208		ug/L		104	66 - 128
trans-1,2-Dichloroethene	20	U	200	211		ug/L		106	56 - 136
Trichloroethene	20	U	200	175		ug/L		87	61 - 124
Vinyl chloride	20	U	200	166		ug/L		83	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*
Toluene-d8 (Surr)	*102*		*78 - 122*
Dibromofluoromethane (Surr)	*98*		*73 - 120*

Lab Sample ID: 240-159556-B-5 MSD
Matrix: Water
Analysis Batch: 512679

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
cis-1,2-Dichloroethene	20	U	200	200		ug/L		100	66 - 128	4	14
trans-1,2-Dichloroethene	20	U	200	205		ug/L		103	56 - 136	3	15
Trichloroethene	20	U	200	176		ug/L		88	61 - 124	1	15
Vinyl chloride	20	U	200	166		ug/L		83	43 - 157	0	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*
4-Bromofluorobenzene (Surr)	*98*		*56 - 136*
Toluene-d8 (Surr)	*100*		*78 - 122*
Dibromofluoromethane (Surr)	*92*		*73 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

GC/MS VOA

Analysis Batch: 512565

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159539-2	MW-202S_110221	Total/NA	Water	8260B	
240-159539-3	MW-202_110221	Total/NA	Water	8260B	
240-159539-4	MW-203S_110221	Total/NA	Water	8260B	
240-159539-5	MW-203_110221	Total/NA	Water	8260B	
MB 240-512565/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512565/4	Lab Control Sample	Total/NA	Water	8260B	
240-159539-5 MS	MW-203_110221	Total/NA	Water	8260B	
240-159539-5 MSD	MW-203_110221	Total/NA	Water	8260B	

Analysis Batch: 512679

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159539-1	TRIP BLANK_16	Total/NA	Water	8260B	
MB 240-512679/7	Method Blank	Total/NA	Water	8260B	
LCS 240-512679/4	Lab Control Sample	Total/NA	Water	8260B	
240-159556-B-5 MS	Matrix Spike	Total/NA	Water	8260B	
240-159556-B-5 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

Client Sample ID: TRIP BLANK_16
Lab Sample ID: 240-159539-1
Date Collected: 11/02/21 00:00
Matrix: Water
Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512679	11/12/21 16:45	LEE	TAL CAN

Client Sample ID: MW-202S_110221
Lab Sample ID: 240-159539-2
Date Collected: 11/02/21 12:31
Matrix: Water
Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512565	11/12/21 06:31	LEE	TAL CAN

Client Sample ID: MW-202_110221
Lab Sample ID: 240-159539-3
Date Collected: 11/02/21 13:46
Matrix: Water
Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512565	11/12/21 06:53	LEE	TAL CAN

Client Sample ID: MW-203S_110221
Lab Sample ID: 240-159539-4
Date Collected: 11/02/21 18:16
Matrix: Water
Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512565	11/12/21 07:16	LEE	TAL CAN

Client Sample ID: MW-203_110221
Lab Sample ID: 240-159539-5
Date Collected: 11/02/21 19:16
Matrix: Water
Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		25	512565	11/12/21 07:38	LEE	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	For lab use only
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		Walk-in client
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30080642.402.04	Shipping/Tracking No:			
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_16	---	---		X						1					N	G		X	X		X	X		1 Trip Blank
MW-202S_110221	11/02/21	12:31		X						3					N	G		X	X		X	X		3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-202_110221	11/02/21	1346		X						3					N	G		X	X		X	X		
MW-203S_110221	11/02/21	1816		X						3					N	G		X	X		X	X		
MW-203_110221	11/02/21	1916		X						3					N	G		X	X		X	X		

240-159539 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com, Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	11/04/21 1558	Novi cold storage	Arcadis	11/04/21 1558
[signature]	ARCADIS	11/5/21 1435	Jeri Hale	ETA	11/5/21 1435
Jeri Hale	ETA	11/5/21 1448	Received in Laboratory by: M. S.	Company: ETA	Date/Time: 11/6/21 8:00

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11/22/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 159539

Client ARCADIS Site Name

Cooler Received on 11/6/21 Opened on 11/6/21

Cooler unpacked by: Matthew Surma

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.3 °C Corrected Cooler Temp. 0.4 °C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
& Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No	(NA) pH Strip Lot# HC157842
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 0104201G	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present?	Yes	(No)

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.

Sample(s) were received in a broken container.

Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.

Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

DATA VERIFICATION REPORT

November 22, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159539-1
Sample date: 2021-11-02
Report received by CADENA: 2021-11-22
Initial Data Verification completed by CADENA: 2021-11-22
Number of Samples:5
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

MSD - MS and MSD recovery outliers or one recovery and the MS/MSD RPD were outliers with the recovery biased LOW for these analytes. Results for the client sample spiked only should be considered to be estimated and qualified with a J flag if detected and UJ flags if non-detect for these analytes:
GCMS VOC sample -005 - TRICHLOROETHYLENE - J flag.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, MS/MSD Recovery, MS/MSD RPD, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

Qualifiers added during verification have been added to the electronic data which is available for download from the CADENA CLMS. Refer to the attached table of analytical results that have been qualified during verification.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Qualified Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159539-1

Sample Name: MW-203_110221
Lab Sample ID: 2401595395
Sample Date: 11/2/2021

Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC					
OSW-8260B					
Trichloroethene	79-01-6	830	25	ug/l	J

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159539-1

		Sample Name:	TRIP BLANK_16				MW-202S_110221				MW-202_110221				MW-203S_110221				MW-203_110221			
		Lab Sample ID:	2401595391				2401595392				2401595393				2401595394				2401595395			
		Sample Date:	11/2/2021				11/2/2021				11/2/2021				11/2/2021				11/2/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC																					
OSW-8260B																					
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	43	25	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	0.82	1.0	ug/l	J	86	25	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	0.52	1.0	ug/l	J	ND	1.0	ug/l	---	18	1.0	ug/l	---	830	25	ug/l	J
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	25	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

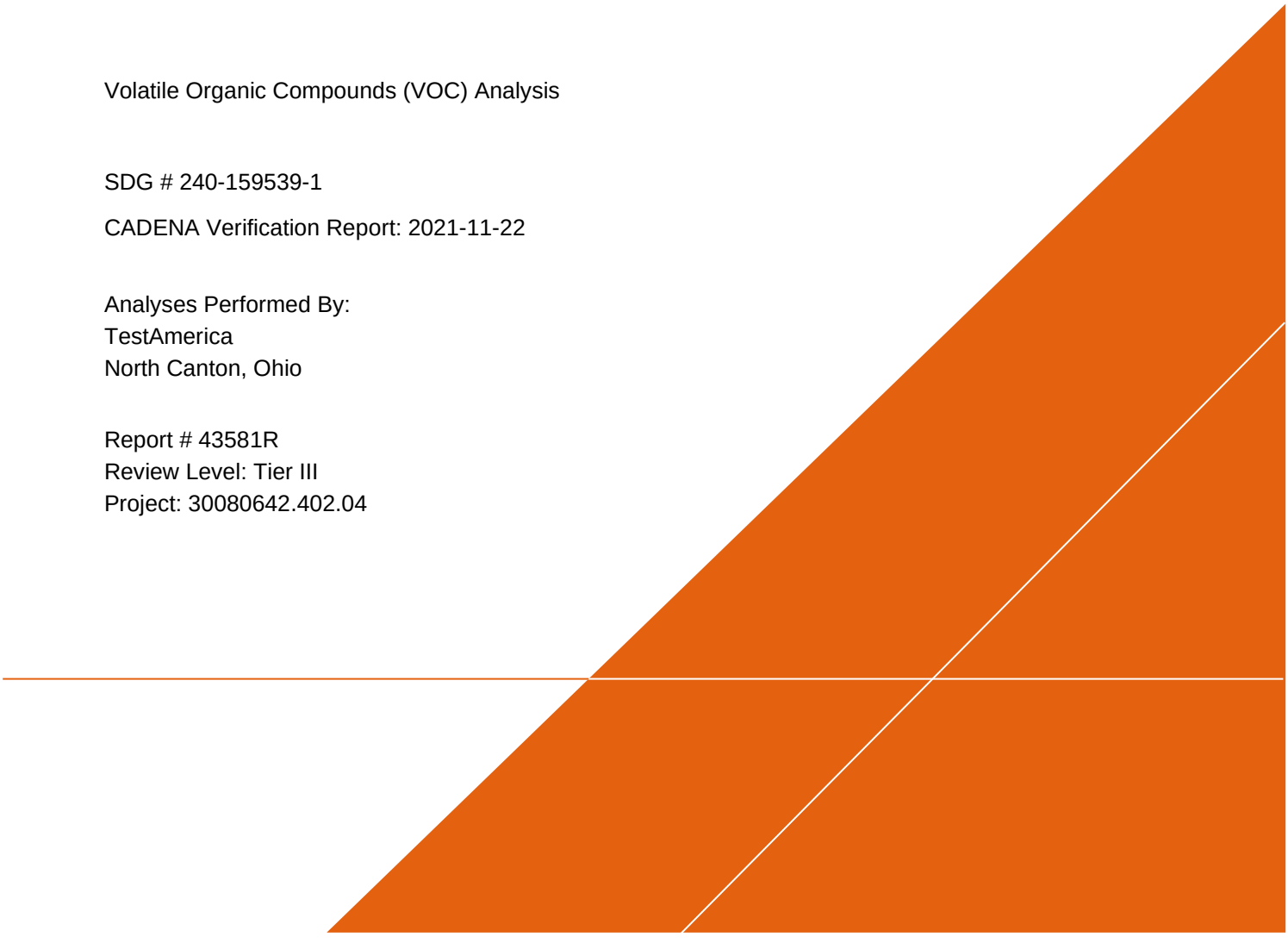
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159539-1

CADENA Verification Report: 2021-11-22

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43581R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159539-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					VOC
TRIP BLANK_16	240-159539-1	Water	11/02/21		X
MW-202S_110221	240-159539-2	Water	11/02/21		X
MW-202_110221	240-159539-3	Water	11/02/21		X
MW-203S_110221	240-159539-4	Water	11/02/21		X
MW-203_110221	240-159539-5	Water	11/02/21		X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

DATA REVIEW

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE:

DATE: December 14, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 14, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day — 10 day		Walk-in client: Lab sampling:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30080642.402.04	Shipping/Tracking No:			
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_16	---	---		X						1					N	G		X	X		X	X		1 Trip Blank
MW-202S_110221	11/02/21	12:31		X						3					N	G		X	X		X	X		3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-202_110221	11/02/21	1346		X						3					N	G		X	X		X	X		
MW-203S_110221	11/02/21	1816		X						3					N	G		X	X		X	X		
MW-203_110221	11/02/21	1916		X						3					N	G		X	X		X	X		

240-159539 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com, Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	11/04/21 1558	Novi cold Storage	Arcadis	11/04/21 1558
[signature]	ARCADIS	11/5/21 1435	Jeri Hale	ETA	11/5/21 1435
Jeri Hale	ETA	11/5/21 1448	Received in Laboratory by: M. S.	Company: ETA	Date/Time: 11/6/21 8:00

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11/22/2021

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

Client Sample ID: TRIP BLANK_16
Date Collected: 11/02/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159539-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 16:45	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 16:45	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 16:45	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 16:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*126*		*62 - 137*		*11/12/21 16:45*	*1*
4-Bromofluorobenzene (Surr)	*66*		*56 - 136*		*11/12/21 16:45*	*1*
Toluene-d8 (Surr)	*87*		*78 - 122*		*11/12/21 16:45*	*1*
Dibromofluoromethane (Surr)	*111*		*73 - 120*		*11/12/21 16:45*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

Client Sample ID: MW-202S_110221
Date Collected: 11/02/21 12:31
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159539-2
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 06:31	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 06:31	1
Trichloroethene	**0.52**	**J**	1.0	0.44	ug/L			11/12/21 06:31	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 06:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*62 - 137*		*11/12/21 06:31*	*1*
4-Bromofluorobenzene (Surr)	*69*		*56 - 136*		*11/12/21 06:31*	*1*
Toluene-d8 (Surr)	*104*		*78 - 122*		*11/12/21 06:31*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*11/12/21 06:31*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

Client Sample ID: MW-202_110221
Date Collected: 11/02/21 13:46
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159539-3
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 06:53	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 06:53	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 06:53	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 06:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*11/12/21 06:53*	*1*
4-Bromofluorobenzene (Surr)	*75*		*56 - 136*		*11/12/21 06:53*	*1*
Toluene-d8 (Surr)	*106*		*78 - 122*		*11/12/21 06:53*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/12/21 06:53*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

Client Sample ID: MW-203S_110221
Date Collected: 11/02/21 18:16
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159539-4
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 07:16	1
trans-1,2-Dichloroethene	**0.82**	**J**	1.0	0.51	ug/L			11/12/21 07:16	1
Trichloroethene	**18**		1.0	0.44	ug/L			11/12/21 07:16	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 07:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*62 - 137*		*11/12/21 07:16*	*1*
4-Bromofluorobenzene (Surr)	*77*		*56 - 136*		*11/12/21 07:16*	*1*
Toluene-d8 (Surr)	*113*		*78 - 122*		*11/12/21 07:16*	*1*
Dibromofluoromethane (Surr)	*97*		*73 - 120*		*11/12/21 07:16*	*1*

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159539-1

Client Sample ID: MW-203_110221

Date Collected: 11/02/21 19:16
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159539-5

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	**43**		25	12	ug/L			11/12/21 07:38	25
trans-1,2-Dichloroethene	**86**		25	13	ug/L			11/12/21 07:38	25
Trichloroethene	**830**	~~F1~~ J	25	11	ug/L			11/12/21 07:38	25
Vinyl chloride	25	U	25	11	ug/L			11/12/21 07:38	25

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*		*11/12/21 07:38*	*25*
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*11/12/21 07:38*	*25*
Toluene-d8 (Surr)	*103*		*78 - 122*		*11/12/21 07:38*	*25*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*11/12/21 07:38*	*25*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159294-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/17/2021 12:40:59 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159294-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159294-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159294-1

Comments
No additional comments.

Receipt
The samples were received on 11/4/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.0° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159294-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159294-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159294-1	TRIP BLANK_20	Water	11/02/21 00:00	11/04/21 08:00
240-159294-2	MW-188S_110221	Water	11/02/21 09:56	11/04/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159294-1

Client Sample ID: TRIP BLANK_20 — Lab Sample ID: 240-159294-1

No Detections.

Client Sample ID: MW-188S_110221 — Lab Sample ID: 240-159294-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159294-1

Client Sample ID: TRIP BLANK_20
Date Collected: 11/02/21 00:00
Date Received: 11/04/21 08:00

Lab Sample ID: 240-159294-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 13:51	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 13:51	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 13:51	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 13:51	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 13:51	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 13:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*62 - 137*		*11/11/21 13:51*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/11/21 13:51*	*1*
Toluene-d8 (Surr)	*90*		*78 - 122*		*11/11/21 13:51*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/11/21 13:51*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159294-1

Client Sample ID: MW-188S_110221

Date Collected: 11/02/21 09:56
Date Received: 11/04/21 08:00

Lab Sample ID: 240-159294-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/09/21 22:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*66 - 120*		*11/09/21 22:24*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 14:13	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 14:13	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 14:13	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 14:13	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 14:13	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 14:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*62 - 137*		*11/11/21 14:13*	*1*
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*11/11/21 14:13*	*1*
Toluene-d8 (Surr)	*88*		*78 - 122*		*11/11/21 14:13*	*1*
Dibromofluoromethane (Surr)	*103*		*73 - 120*		*11/11/21 14:13*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159294-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159294-1	TRIP BLANK_20	117	70	90	102
240-159294-2	MW-188S_110221	117	73	88	103
240-159310-H-2 MS	Matrix Spike	103	98	103	94
240-159310-K-2 MSD	Matrix Spike Duplicate	103	96	102	92
LCS 240-512503/4	Lab Control Sample	102	94	101	93
MB 240-512503/7	Method Blank	114	77	90	98

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159294-2	MW-188S_110221	94
240-159369-D-5 MS	Matrix Spike	92
240-159369-D-5 MSD	Matrix Spike Duplicate	89
LCS 240-512125/4	Lab Control Sample	93
MB 240-512125/5	Method Blank	91

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512503/7
Matrix: Water
Analysis Batch: 512503

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 13:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 13:07	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 13:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 13:07	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 13:07	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 13:07	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*114*		*62 - 137*		*11/11/21 13:07*	*1*
4-Bromofluorobenzene (Surr)	*77*		*56 - 136*		*11/11/21 13:07*	*1*
Toluene-d8 (Surr)	*90*		*78 - 122*		*11/11/21 13:07*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/11/21 13:07*	*1*

Lab Sample ID: LCS 240-512503/4
Matrix: Water
Analysis Batch: 512503

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.54		ug/L		85	63 - 134
cis-1,2-Dichloroethene	10.0	10.9		ug/L		109	77 - 123
Tetrachloroethene	10.0	9.61		ug/L		96	76 - 123
trans-1,2-Dichloroethene	10.0	11.3		ug/L		113	75 - 124
Trichloroethene	10.0	9.58		ug/L		96	70 - 122
Vinyl chloride	10.0	8.69		ug/L		87	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*
Toluene-d8 (Surr)	*101*		*78 - 122*
Dibromofluoromethane (Surr)	*93*		*73 - 120*

Lab Sample ID: 240-159310-H-2 MS
Matrix: Water
Analysis Batch: 512503

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	8.69		ug/L		87	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.70		ug/L		97	66 - 128
Tetrachloroethene	1.0	U	10.0	8.74		ug/L		87	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	10.1		ug/L		101	56 - 136
Trichloroethene	1.0	U	10.0	8.43		ug/L		84	61 - 124
Vinyl chloride	1.0	U	10.0	8.11		ug/L		81	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*
4-Bromofluorobenzene (Surr)	*98*		*56 - 136*
Toluene-d8 (Surr)	*103*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159310-H-2 MS
Matrix: Water
Analysis Batch: 512503

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: 240-159310-K-2 MSD
Matrix: Water
Analysis Batch: 512503

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	8.78		ug/L		88	56 - 135	1	26
cis-1,2-Dichloroethene	1.0	U	10.0	10.0		ug/L		100	66 - 128	3	14
Tetrachloroethene	1.0	U	10.0	8.65		ug/L		86	62 - 131	1	20
trans-1,2-Dichloroethene	1.0	U	10.0	10.2		ug/L		102	56 - 136	1	15
Trichloroethene	1.0	U	10.0	8.58		ug/L		86	61 - 124	2	15
Vinyl chloride	1.0	U	10.0	8.51		ug/L		85	43 - 157	5	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*
4-Bromofluorobenzene (Surr)	*96*		*56 - 136*
Toluene-d8 (Surr)	*102*		*78 - 122*
Dibromofluoromethane (Surr)	*92*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512125/5
Matrix: Water
Analysis Batch: 512125

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/09/21 13:38	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*66 - 120*		*11/09/21 13:38*	*1*

Lab Sample ID: LCS 240-512125/4
Matrix: Water
Analysis Batch: 512125

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.3		ug/L		103	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*66 - 120*

Lab Sample ID: 240-159369-D-5 MS
Matrix: Water
Analysis Batch: 512125

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	9.49		ug/L		95	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*92*		*66 - 120*

Lab Sample ID: 240-159369-D-5 MSD
Matrix: Water
Analysis Batch: 512125

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.5		ug/L		105	51 - 153	11	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*89*		*66 - 120*

GC/MS VOA

Analysis Batch: 512125

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159294-2	MW-188S_110221	Total/NA	Water	8260B SIM	
MB 240-512125/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512125/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159369-D-5 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159369-D-5 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 512503

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159294-1	TRIP BLANK_20	Total/NA	Water	8260B	
240-159294-2	MW-188S_110221	Total/NA	Water	8260B	
MB 240-512503/7	Method Blank	Total/NA	Water	8260B	
LCS 240-512503/4	Lab Control Sample	Total/NA	Water	8260B	
240-159310-H-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159310-K-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159294-1

Client Sample ID: TRIP BLANK_20

Lab Sample ID: 240-159294-1

Date Collected: 11/02/21 00:00

Matrix: Water

Date Received: 11/04/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512503	11/11/21 13:51	LEE	TAL CAN

Client Sample ID: MW-188S_110221

Lab Sample ID: 240-159294-2

Date Collected: 11/02/21 09:56

Matrix: Water

Date Received: 11/04/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512503	11/11/21 14:13	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512125	11/09/21 22:24	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159294-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN
190

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Chain of Custody Record

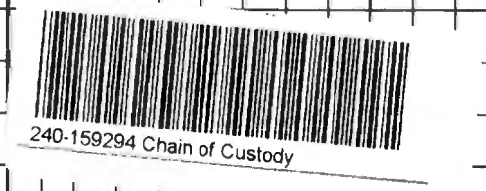
TestAmerica

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	☐ DW ☐ NPDES ☐ RCRA ☐ Other				
Address: 28550 Cabot Drive, Suite 500		Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377		Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240		Sampler Name: Allyson Hartz	TAT if different from below: ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client: Lab sampling: Job/SDG No:
Project Name: Ford LTP Off-Site		Method of Shipment/Carrier:			
Project Number: 30080642.402.04		Shipping/Tracking No:			
PO # 30080642.402.04					

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_20	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1005_110221	11/2/21	956		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM



Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Allyson Hartz	Arcadis	11/2/21 1615	Novi cold storage	Arcadis	11/2/21 1615
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	ARCADIS	11/3/21 0940	[signature]	ETA	11/3/21 946
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
[signature]	ETA	11/3/21 1006	[signature]	ETA	11-4-21 8:05

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11/17/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159294**
Canton Facility

Client Arcadis Site Name

Cooler Received on 11-4-21 Opened on 11-4-21

Cooler unpacked by: Mandilyn Bleck

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: ~~Bubble Wrap~~ Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF **+0.1** °C) Observed Cooler Temp. 0.9 °C Corrected Cooler Temp. 1.0 °C
   IR GUN #IR-15 (CF **+0.2**°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity ____	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# **HC157842**
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ____	Yes	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes	No

11/4/21

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page | Samples processed by:

The TB is not logged for SIM due to insufficient volume.
JMD 11/4/21

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

November 17, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159294-1
Sample date: 2021-11-02
Report received by CADENA: 2021-11-17
Initial Data Verification completed by CADENA: 2021-11-17
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159294-1

		Sample Name:	TRIP BLANK_20				MW-188S_110221			
		Lab Sample ID:	2401592941				2401592942			
		Sample Date:	11/2/2021				11/2/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

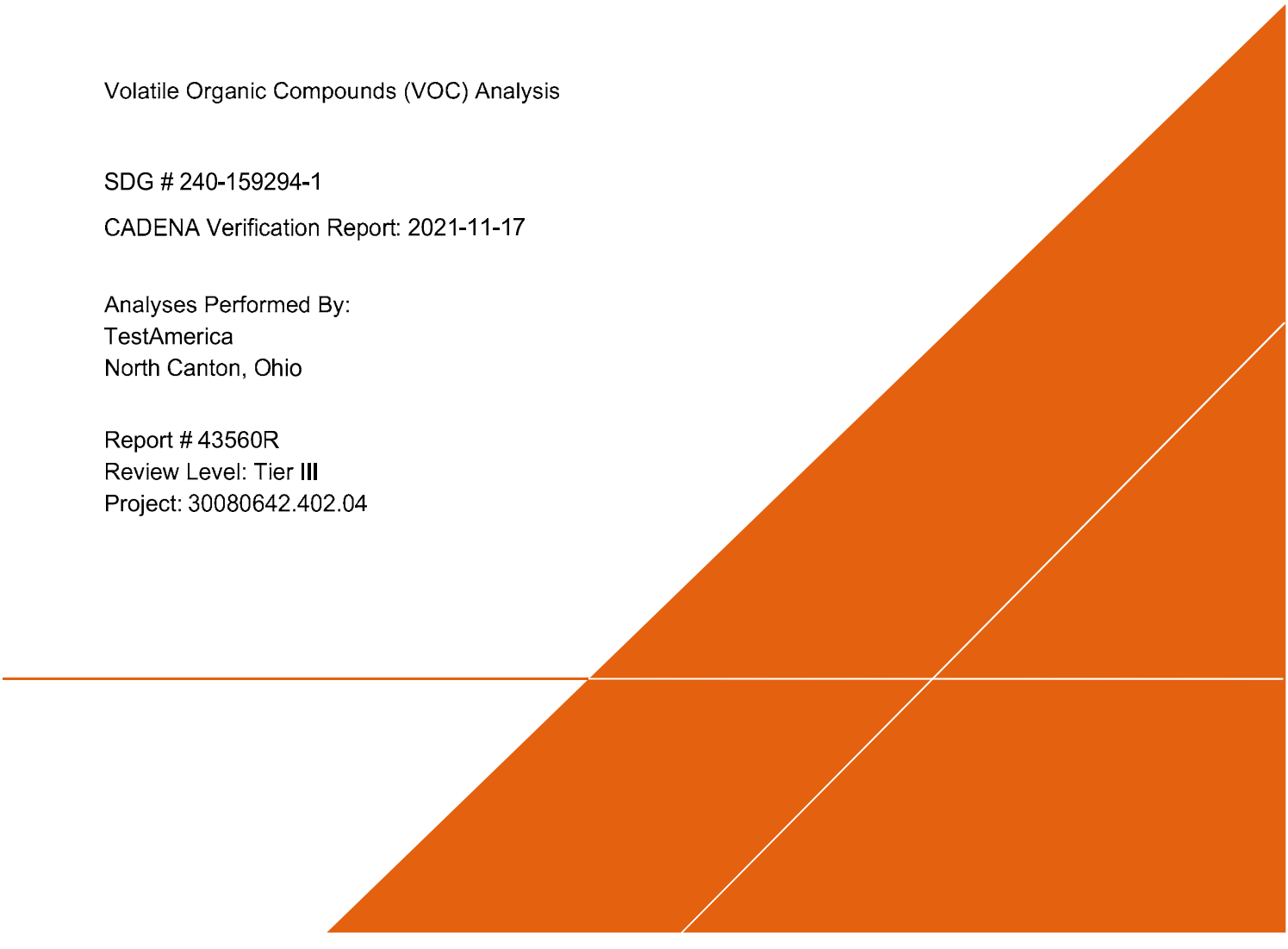
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159294-1

CADENA Verification Report: 2021-11-17

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43560R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159294-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_20	240-159294-1	Water	11/02/2021		X	
MW-188S_110221	240-159294-2	Water	11/02/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Compound	Criteria
TRIP BLANK_20 MW-188S_110221	Continuous Calibration Verification %D	trans-1,2-Dichloroethene	+21.5%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	

Initial/Continuing	Criteria	Sample Result	Qualification
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE: 

DATE: December 02, 2021

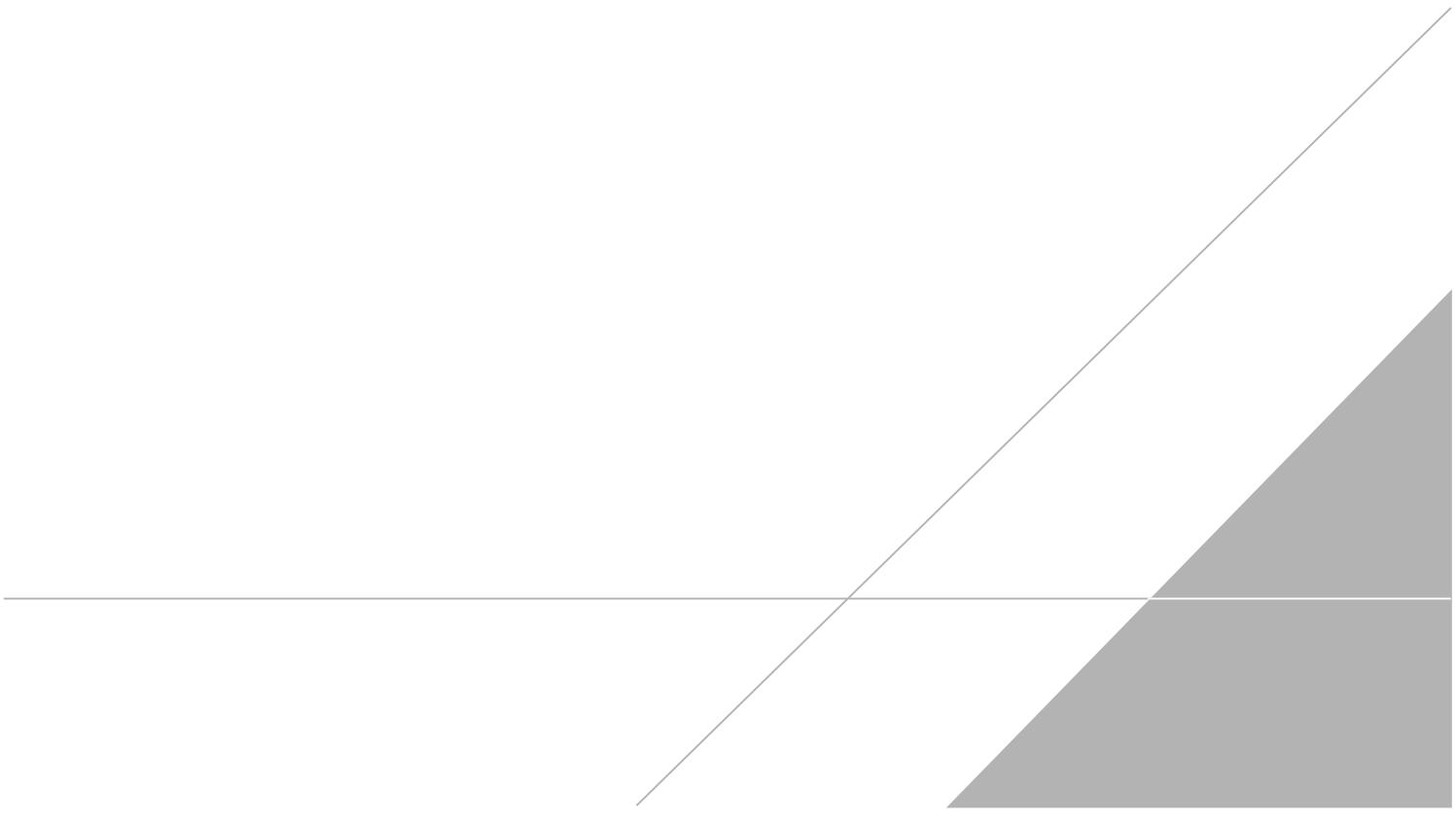
PEER REVIEW: Andrew Korycinski

DATE: December 2, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



MICHIGAN
190

0.9/1.0

Chain of Custody Record

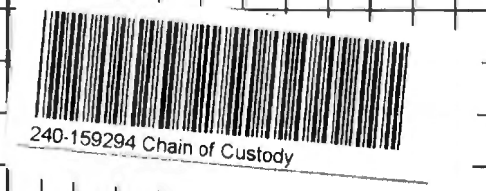
TestAmerica

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	☐ DW ☐ NPDES ☐ RCRA ☐ Other				
Address: 28550 Cabot Drive, Suite 500		Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377		Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240		Sampler Name: Allyson Hartz	TAT if different from below: ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client: Lab sampling: Job/SDG No:
Project Name: Ford LTP Off-Site		Method of Shipment/Carrier:			
Project Number: 30080642.402.04		Shipping/Tracking No:			
PO # 30080642.402.04					

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_20	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1005_110221	11/2/21	956		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM



Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Allyson Hartz	Arcadis	11/2/21 1615	Novi cold storage	Arcadis	11/2/21 1615
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	ARCADIS	11/3/21 0940	[signature]	ETA	11/3/21 946
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
[signature]	ETA	11/3/21 1006	[signature]	ETA	11-4-21 8:05

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11/17/2021

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159294-1

Client Sample ID: TRIP BLANK_20
Date Collected: 11/02/21 00:00
Date Received: 11/04/21 08:00

Lab Sample ID: 240-159294-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 13:51	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 13:51	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 13:51	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 13:51	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 13:51	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 13:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*62 - 137*		*11/11/21 13:51*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/11/21 13:51*	*1*
Toluene-d8 (Surr)	*90*		*78 - 122*		*11/11/21 13:51*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/11/21 13:51*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159294-1

Client Sample ID: MW-188S_110221

Date Collected: 11/02/21 09:56
Date Received: 11/04/21 08:00

Lab Sample ID: 240-159294-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/09/21 22:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*66 - 120*		*11/09/21 22:24*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 14:13	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 14:13	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 14:13	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 14:13	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 14:13	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 14:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*62 - 137*		*11/11/21 14:13*	*1*
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*11/11/21 14:13*	*1*
Toluene-d8 (Surr)	*88*		*78 - 122*		*11/11/21 14:13*	*1*
Dibromofluoromethane (Surr)	*103*		*73 - 120*		*11/11/21 14:13*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-160204-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/30/2021 2:46:09 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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Have a Question? Ask The Expert

Visit us at:
www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160204-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-160204-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-160204-1

Comments
No additional comments.

Receipt
The samples were received on 11/17/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.3° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160204-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160204-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-160204-1	TRIP BLANK_138	Water	11/15/21 00:00	11/17/21 08:00
240-160204-2	MW-214S_111521	Water	11/15/21 13:05	11/17/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160204-1

Client Sample ID: TRIP BLANK_138 — Lab Sample ID: 240-160204-1

No Detections.

Client Sample ID: MW-214S_111521 — Lab Sample ID: 240-160204-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160204-1

Client Sample ID: TRIP BLANK_138
Date Collected: 11/15/21 00:00
Date Received: 11/17/21 08:00

Lab Sample ID: 240-160204-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/23/21 20:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/23/21 20:44	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/23/21 20:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/23/21 20:44	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/23/21 20:44	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/23/21 20:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/23/21 20:44*	*1*
4-Bromofluorobenzene (Surr)	*95*		*56 - 136*		*11/23/21 20:44*	*1*
Toluene-d8 (Surr)	*103*		*78 - 122*		*11/23/21 20:44*	*1*
Dibromofluoromethane (Surr)	*106*		*73 - 120*		*11/23/21 20:44*	*1*

Client Sample ID: MW-214S_111521

Date Collected: 11/15/21 13:05
Date Received: 11/17/21 08:00

Lab Sample ID: 240-160204-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/19/21 04:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*66 - 120*		*11/19/21 04:09*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/23/21 23:29	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/23/21 23:29	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/23/21 23:29	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/23/21 23:29	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/23/21 23:29	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/23/21 23:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/23/21 23:29*	*1*
4-Bromofluorobenzene (Surr)	*93*		*56 - 136*		*11/23/21 23:29*	*1*
Toluene-d8 (Surr)	*99*		*78 - 122*		*11/23/21 23:29*	*1*
Dibromofluoromethane (Surr)	*103*		*73 - 120*		*11/23/21 23:29*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160204-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-160204-1	TRIP BLANK_138	99	95	103	106
240-160204-2	MW-214S_111521	99	93	99	103
240-160551-B-10 MS	Matrix Spike	95	95	104	104
240-160551-B-10 MSD	Matrix Spike Duplicate	93	98	106	103
LCS 240-514335/5	Lab Control Sample	90	94	98	103
MB 240-514335/8	Method Blank	92	89	95	101

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-160158-G-2 MS	Matrix Spike	90
240-160158-M-2 MSD	Matrix Spike Duplicate	92
240-160204-2	MW-214S_111521	89
LCS 240-513701/4	Lab Control Sample	88
MB 240-513701/5	Method Blank	85

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-514335/8
Matrix: Water
Analysis Batch: 514335

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/23/21 15:59	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/23/21 15:59	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/23/21 15:59	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/23/21 15:59	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/23/21 15:59	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/23/21 15:59	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/23/21 15:59*	*1*
4-Bromofluorobenzene (Surr)	*89*		*56 - 136*		*11/23/21 15:59*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*11/23/21 15:59*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/23/21 15:59*	*1*

Lab Sample ID: LCS 240-514335/5
Matrix: Water
Analysis Batch: 514335

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	25.7		ug/L		103	63 - 134
cis-1,2-Dichloroethene	25.0	23.8		ug/L		95	77 - 123
Tetrachloroethene	25.0	26.5		ug/L		106	76 - 123
trans-1,2-Dichloroethene	25.0	24.4		ug/L		98	75 - 124
Trichloroethene	25.0	25.1		ug/L		101	70 - 122
Vinyl chloride	25.0	20.3		ug/L		81	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*
Toluene-d8 (Surr)	*98*		*78 - 122*
Dibromofluoromethane (Surr)	*103*		*73 - 120*

Lab Sample ID: 240-160551-B-10 MS
Matrix: Water
Analysis Batch: 514335

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	250	U	6250	6360		ug/L		102	56 - 135
cis-1,2-Dichloroethene	250	U	6250	5850		ug/L		94	66 - 128
Tetrachloroethene	250	U	6250	6810		ug/L		109	62 - 131
trans-1,2-Dichloroethene	250	U	6250	6190		ug/L		99	56 - 136
Trichloroethene	250	U	6250	6660		ug/L		107	61 - 124
Vinyl chloride	250	U	6250	5070		ug/L		81	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*95*		*62 - 137*
4-Bromofluorobenzene (Surr)	*95*		*56 - 136*
Toluene-d8 (Surr)	*104*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-160551-B-10 MS
Matrix: Water
Analysis Batch: 514335

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*104*		*73 - 120*

Lab Sample ID: 240-160551-B-10 MSD
Matrix: Water
Analysis Batch: 514335

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	250	U	6250	6130		ug/L		98	56 - 135	4	26
cis-1,2-Dichloroethene	250	U	6250	5840		ug/L		93	66 - 128	0	14
Tetrachloroethene	250	U	6250	6750		ug/L		108	62 - 131	1	20
trans-1,2-Dichloroethene	250	U	6250	6000		ug/L		96	56 - 136	3	15
Trichloroethene	250	U	6250	6420		ug/L		103	61 - 124	4	15
Vinyl chloride	250	U	6250	4950		ug/L		79	43 - 157	2	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*98*		*56 - 136*
Toluene-d8 (Surr)	*106*		*78 - 122*
Dibromofluoromethane (Surr)	*103*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513701/5
Matrix: Water
Analysis Batch: 513701

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 19:39	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/18/21 19:39*	*1*

Lab Sample ID: LCS 240-513701/4
Matrix: Water
Analysis Batch: 513701

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.2		ug/L		102	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*66 - 120*

Lab Sample ID: 240-160158-G-2 MS
Matrix: Water
Analysis Batch: 513701

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*90*		*66 - 120*

Lab Sample ID: 240-160158-M-2 MSD
Matrix: Water
Analysis Batch: 513701

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.5		ug/L		105	51 - 153	1	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*92*		*66 - 120*

GC/MS VOA

Analysis Batch: 513701

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-160204-2	MW-214S_111521	Total/NA	Water	8260B SIM	
MB 240-513701/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513701/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-160158-G-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-160158-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 514335

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-160204-1	TRIP BLANK_138	Total/NA	Water	8260B	
240-160204-2	MW-214S_111521	Total/NA	Water	8260B	
MB 240-514335/8	Method Blank	Total/NA	Water	8260B	
LCS 240-514335/5	Lab Control Sample	Total/NA	Water	8260B	
240-160551-B-10 MS	Matrix Spike	Total/NA	Water	8260B	
240-160551-B-10 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160204-1

Client Sample ID: TRIP BLANK_138

Lab Sample ID: 240-160204-1

Date Collected: 11/15/21 00:00

Matrix: Water

Date Received: 11/17/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	514335	11/23/21 20:44	SAM	TAL CAN

Client Sample ID: MW-214S_111521

Lab Sample ID: 240-160204-2

Date Collected: 11/15/21 13:05

Matrix: Water

Date Received: 11/17/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	514335	11/23/21 23:29	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	513701	11/19/21 04:09	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160204-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

0.2/0.3

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Kim Klindle / COURIER: CHRISTINA WERNER	TAT if different from below: ☐ 3 weeks ☑ 10 day ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client: Lab sampling: Job/SDG No:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			
Project Number: 30080642.402.04	Shipping/Tracking No:			
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_138	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-2145_111521	11/15/21	13:05		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-160204 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal ByLab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company:	Date/Time:		Company:	Date/Time:
Relinquished by:	Arcadis	11/15/21 16:45	Received by: Non cold storage	Arcadis	11/15/21 16:45
Relinquished by:	ARCADIS	11/16/21 1043	Received by:	EIA	11/16/21 1043
Relinquished by:	EIA	11/16/21	Received in Laboratory by:		11/17/21 800

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11/30/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 160204**
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Trent

Cooler Received on 11/17/21 Opened on 11/17/21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # 764 Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.2 °C Corrected Cooler Temp. 0.3 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC157842
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 210420G	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page | Samples processed by:

No SIM on TB per Corrected COC. JME 11/17/21

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

WI-NC-099

DATA VERIFICATION REPORT

November 30, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 160204-1
Sample date: 2021-11-15
Report received by CADENA: 2021-11-30
Initial Data Verification completed by CADENA: 2021-11-30
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 160204-1

		Sample Name:	TRIP BLANK_138				MW-214S_111521			
		Lab Sample ID:	2401602041				2401602042			
		Sample Date:	11/15/2021				11/15/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

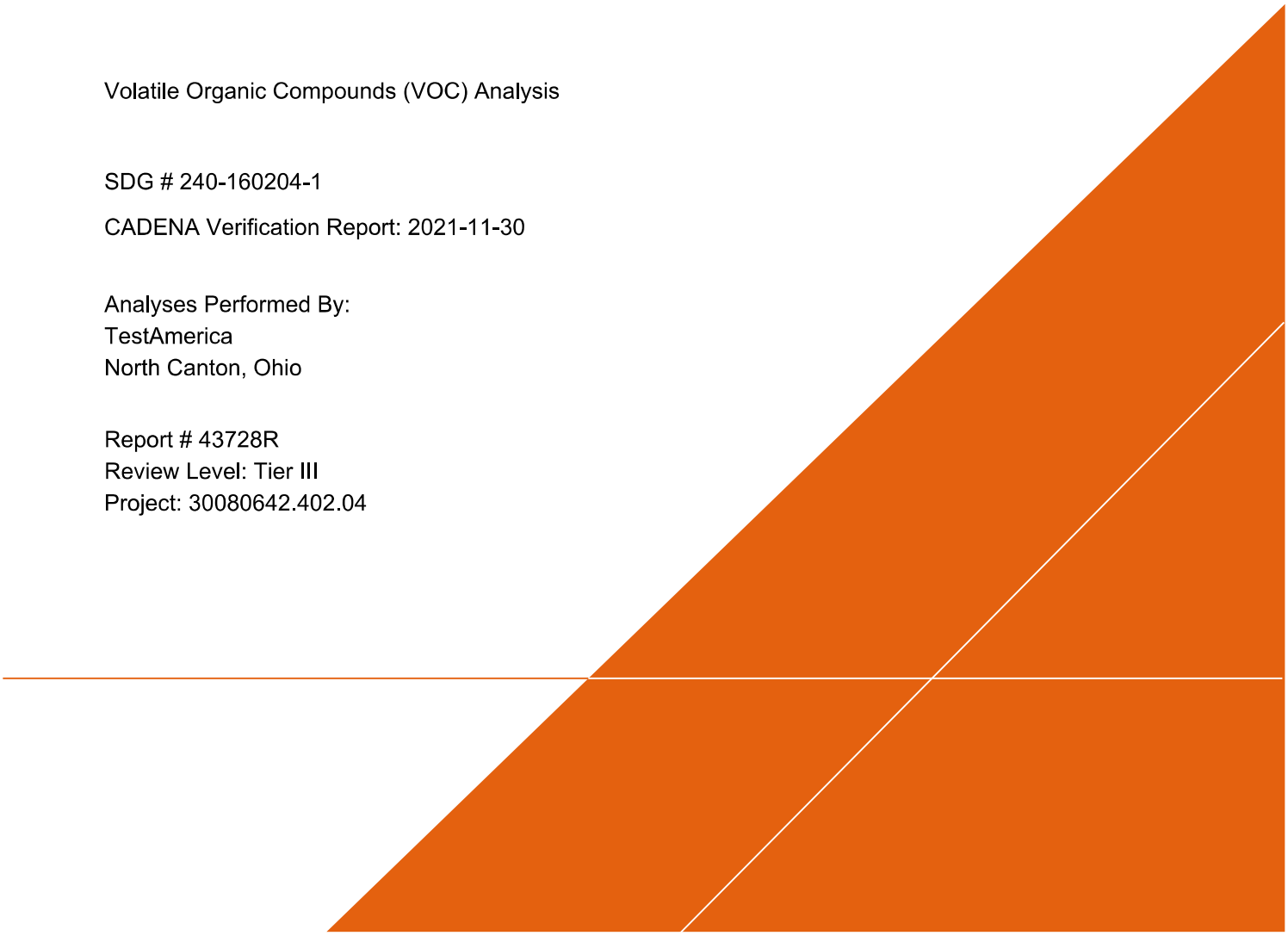
Volatile Organic Compounds (VOC) Analysis

SDG # 240-160204-1

CADENA Verification Report: 2021-11-30

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43728R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-160204-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_138	240-160204-1	Water	11/15/21		X	
MW-214S_111521	240-160204-2	Water	11/15/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190

0.2/6.3

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	DW / NPDES / RCRA / Other	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500		Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377		Sampler Name: Jim Tindall / COURIER: CHRISTIAN WERNER	TAT if different from below: 10 day; 3 weeks / 2 weeks / 1 week / 2 days / 1 day		Walk-in client
Phone: 248-994-2240		Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site		Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04					
PO # 30080642.402.04					

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_138	—	—		X						1					N	C	X	X	X	X	X	X	X	1 Trip Blank
MW-245_111521	11/15/21	13:05		b						b					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-160204 Chain of Custody

Possible Hazard Identification: Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / Disposal By Lab / Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	11/15/21 16:45	Non cold storage	Arcadis	11/15/21 16:45
[signature]	ARCADIS	11/16/21 1043	[signature]	ETA	11/16/21 1043
[signature]	ETA	11/16/21	[signature]	CTS	11/17/21 800

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11/30/2021

Client Sample ID: TRIP BLANK_138
Lab Sample ID: 240-160204-1
Date Collected: 11/15/21 00:00
Matrix: Water
Date Received: 11/17/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/23/21 20:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/23/21 20:44	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/23/21 20:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/23/21 20:44	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/23/21 20:44	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/23/21 20:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/23/21 20:44*	*1*
4-Bromofluorobenzene (Surr)	*95*		*56 - 136*		*11/23/21 20:44*	*1*
Toluene-d8 (Surr)	*103*		*78 - 122*		*11/23/21 20:44*	*1*
Dibromofluoromethane (Surr)	*106*		*73 - 120*		*11/23/21 20:44*	*1*

Client Sample ID: MW-214S_111521
Lab Sample ID: 240-160204-2
Date Collected: 11/15/21 13:05
Matrix: Water
Date Received: 11/17/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/19/21 04:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*66 - 120*		*11/19/21 04:09*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/23/21 23:29	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/23/21 23:29	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/23/21 23:29	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/23/21 23:29	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/23/21 23:29	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/23/21 23:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/23/21 23:29*	*1*
4-Bromofluorobenzene (Surr)	*93*		*56 - 136*		*11/23/21 23:29*	*1*
Toluene-d8 (Surr)	*99*		*78 - 122*		*11/23/21 23:29*	*1*
Dibromofluoromethane (Surr)	*103*		*73 - 120*		*11/23/21 23:29*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159302-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/18/2021 3:18:58 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159302-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159302-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159302-1

Comments
No additional comments.

Receipt
The samples were received on 11/4/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.0° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159302-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159302-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159302-1	TRIP BLANK_21	Water	11/02/21 00:00	11/04/21 08:00
240-159302-2	MW-187_110221	Water	11/02/21 11:21	11/04/21 08:00
240-159302-3	MW-187S_110221	Water	11/02/21 12:25	11/04/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159302-1

Client Sample ID: TRIP BLANK_21 — Lab Sample ID: 240-159302-1

No Detections.

Client Sample ID: MW-187_110221 — Lab Sample ID: 240-159302-2

No Detections.

Client Sample ID: MW-187S_110221 — Lab Sample ID: 240-159302-3

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159302-1

Client Sample ID: TRIP BLANK_21

Date Collected: 11/02/21 00:00
Date Received: 11/04/21 08:00

Lab Sample ID: 240-159302-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 19:18	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 19:18	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 19:18	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 19:18	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 19:18	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 19:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*122*		*62 - 137*		*11/11/21 19:18*	*1*
4-Bromofluorobenzene (Surr)	*69*		*56 - 136*		*11/11/21 19:18*	*1*
Toluene-d8 (Surr)	*90*		*78 - 122*		*11/11/21 19:18*	*1*
Dibromofluoromethane (Surr)	*108*		*73 - 120*		*11/11/21 19:18*	*1*

Client Sample ID: MW-187_110221

Date Collected: 11/02/21 11:21
Date Received: 11/04/21 08:00

Lab Sample ID: 240-159302-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/09/21 23:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*90*		*66 - 120*		*11/09/21 23:36*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 19:40	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 19:40	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 19:40	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 19:40	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 19:40	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 19:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*121*		*62 - 137*		*11/11/21 19:40*	*1*
4-Bromofluorobenzene (Surr)	*69*		*56 - 136*		*11/11/21 19:40*	*1*
Toluene-d8 (Surr)	*88*		*78 - 122*		*11/11/21 19:40*	*1*
Dibromofluoromethane (Surr)	*108*		*73 - 120*		*11/11/21 19:40*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159302-1

Client Sample ID: MW-187S_110221

Lab Sample ID: 240-159302-3

Date Collected: 11/02/21 12:25

Matrix: Water

Date Received: 11/04/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/10/21 21:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/10/21 21:46*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 20:02	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 20:02	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 20:02	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 20:02	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 20:02	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 20:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*121*		*62 - 137*		*11/11/21 20:02*	*1*
4-Bromofluorobenzene (Surr)	*67*		*56 - 136*		*11/11/21 20:02*	*1*
Toluene-d8 (Surr)	*90*		*78 - 122*		*11/11/21 20:02*	*1*
Dibromofluoromethane (Surr)	*107*		*73 - 120*		*11/11/21 20:02*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159302-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159302-1	TRIP BLANK_21	122	69	90	108
240-159302-2	MW-187_110221	121	69	88	108
240-159302-3	MW-187S_110221	121	67	90	107
240-159310-H-2 MS	Matrix Spike	103	98	103	94
240-159310-K-2 MSD	Matrix Spike Duplicate	103	96	102	92
LCS 240-512503/4	Lab Control Sample	102	94	101	93
MB 240-512503/7	Method Blank	114	77	90	98

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159302-2	MW-187_110221	90
240-159302-3	MW-187S_110221	85
240-159310-G-2 MS	Matrix Spike	84
240-159310-M-2 MSD	Matrix Spike Duplicate	84
240-159369-D-5 MS	Matrix Spike	92
240-159369-D-5 MSD	Matrix Spike Duplicate	89
LCS 240-512125/4	Lab Control Sample	93
LCS 240-512369/6	Lab Control Sample	85
MB 240-512125/5	Method Blank	91
MB 240-512369/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512503/7
Matrix: Water
Analysis Batch: 512503

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 13:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 13:07	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 13:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 13:07	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 13:07	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 13:07	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*114*		*62 - 137*		*11/11/21 13:07*	*1*
4-Bromofluorobenzene (Surr)	*77*		*56 - 136*		*11/11/21 13:07*	*1*
Toluene-d8 (Surr)	*90*		*78 - 122*		*11/11/21 13:07*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/11/21 13:07*	*1*

Lab Sample ID: LCS 240-512503/4
Matrix: Water
Analysis Batch: 512503

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.54		ug/L		85	63 - 134
cis-1,2-Dichloroethene	10.0	10.9		ug/L		109	77 - 123
Tetrachloroethene	10.0	9.61		ug/L		96	76 - 123
trans-1,2-Dichloroethene	10.0	11.3		ug/L		113	75 - 124
Trichloroethene	10.0	9.58		ug/L		96	70 - 122
Vinyl chloride	10.0	8.69		ug/L		87	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*
Toluene-d8 (Surr)	*101*		*78 - 122*
Dibromofluoromethane (Surr)	*93*		*73 - 120*

Lab Sample ID: 240-159310-H-2 MS
Matrix: Water
Analysis Batch: 512503

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	8.69		ug/L		87	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.70		ug/L		97	66 - 128
Tetrachloroethene	1.0	U	10.0	8.74		ug/L		87	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	10.1		ug/L		101	56 - 136
Trichloroethene	1.0	U	10.0	8.43		ug/L		84	61 - 124
Vinyl chloride	1.0	U	10.0	8.11		ug/L		81	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*
4-Bromofluorobenzene (Surr)	*98*		*56 - 136*
Toluene-d8 (Surr)	*103*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159310-H-2 MS
Matrix: Water
Analysis Batch: 512503

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: 240-159310-K-2 MSD
Matrix: Water
Analysis Batch: 512503

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	8.78		ug/L		88	56 - 135	1	26
cis-1,2-Dichloroethene	1.0	U	10.0	10.0		ug/L		100	66 - 128	3	14
Tetrachloroethene	1.0	U	10.0	8.65		ug/L		86	62 - 131	1	20
trans-1,2-Dichloroethene	1.0	U	10.0	10.2		ug/L		102	56 - 136	1	15
Trichloroethene	1.0	U	10.0	8.58		ug/L		86	61 - 124	2	15
Vinyl chloride	1.0	U	10.0	8.51		ug/L		85	43 - 157	5	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*
4-Bromofluorobenzene (Surr)	*96*		*56 - 136*
Toluene-d8 (Surr)	*102*		*78 - 122*
Dibromofluoromethane (Surr)	*92*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512125/5
Matrix: Water
Analysis Batch: 512125

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/09/21 13:38	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*66 - 120*		*11/09/21 13:38*	*1*

Lab Sample ID: LCS 240-512125/4
Matrix: Water
Analysis Batch: 512125

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.3		ug/L		103	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*66 - 120*

Lab Sample ID: 240-159369-D-5 MS
Matrix: Water
Analysis Batch: 512125

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	9.49		ug/L		95	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	92		66 - 120

Lab Sample ID: 240-159369-D-5 MSD — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 512125

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.5		ug/L		105	51 - 153	11	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	89		66 - 120

Lab Sample ID: MB 240-512369/5 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 512369

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/10/21 19:46	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	84		66 - 120		11/10/21 19:46	1

Lab Sample ID: LCS 240-512369/6 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 512369

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	9.53		ug/L		95	80 - 122		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	85		66 - 120

Lab Sample ID: 240-159310-G-2 MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 512369

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U F1	10.0	9.69		ug/L		97	51 - 153		

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	84		66 - 120

Lab Sample ID: 240-159310-M-2 MSD — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 512369

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.59		ug/L		96	51 - 153	1	16

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159310-M-2 MSD
Matrix: Water
Analysis Batch: 512369

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159302-1

GC/MS VOA

Analysis Batch: 512125

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159302-2	MW-187_110221	Total/NA	Water	8260B SIM	
MB 240-512125/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512125/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159369-D-5 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159369-D-5 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 512369

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159302-3	MW-187S_110221	Total/NA	Water	8260B SIM	
MB 240-512369/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512369/6	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159310-G-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159310-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 512503

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159302-1	TRIP BLANK_21	Total/NA	Water	8260B	
240-159302-2	MW-187_110221	Total/NA	Water	8260B	
240-159302-3	MW-187S_110221	Total/NA	Water	8260B	
MB 240-512503/7	Method Blank	Total/NA	Water	8260B	
LCS 240-512503/4	Lab Control Sample	Total/NA	Water	8260B	
240-159310-H-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159310-K-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159302-1

Client Sample ID: TRIP BLANK_21

Lab Sample ID: 240-159302-1

Date Collected: 11/02/21 00:00

Matrix: Water

Date Received: 11/04/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512503	11/11/21 19:18	LEE	TAL CAN

Client Sample ID: MW-187_110221

Lab Sample ID: 240-159302-2

Date Collected: 11/02/21 11:21

Matrix: Water

Date Received: 11/04/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512503	11/11/21 19:40	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512125	11/09/21 23:36	CS	TAL CAN

Client Sample ID: MW-187S_110221

Lab Sample ID: 240-159302-3

Date Collected: 11/02/21 12:25

Matrix: Water

Date Received: 11/04/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512503	11/11/21 20:02	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512369	11/10/21 21:46	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159302-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

MICHIGAN 190 TestAmerica

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	☐ DW ☐ NPDES ☐ RCRA ☐ Other	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500		Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377		Sampler Name: Allyson Hartz	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client:
Phone: 248-994-2240		Method of Shipment/Carrier:	10 day		Lab sampling:
Project Name: Ford LTP Off-Site		Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04					
PO # 30080642.402.04					

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_21	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-107_110221	11/2/21	11:21		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-107S_110221	11/2/21	12:25		X						6					N	G	X	X	X	X	X	X	X	↓

240-159302 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203831
Level IV Reporting requested

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Allyson Hartz	Arcadis	11/2/21 1615	Nan cold storage	Arcadis	11/2/21 1615
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	ARCADIS	11/3/21 0940	[signature]	ETA	11/3/21 946
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
[signature]	ETA	11/3/21 1006	Marcelyn Block	ETA	11-4-21 800

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11/18/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159302**
Canton Facility

Client Arcadis Site Name

Cooler unpacked by: Mandelyn Black

Cooler Received on 11-4-21 Opened on 11-4-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA7 Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.9 °C Corrected Cooler Temp. 1.0 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity ____	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC157842
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ____	Yes	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes	No

11-4-21

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

The TB is not logged for SIM due to insufficient volume.
11-4-21

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.

Sample(s) ____ were received in a broken container.

Sample(s) MW-187S were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.

Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

November 18, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159302-1
Sample date: 2021-11-02
Report received by CADENA: 2021-11-18
Initial Data Verification completed by CADENA: 2021-11-18
Number of Samples:3
Sample Matrices:Water and trip blank
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159302-1

		Sample Name:	TRIP BLANK_21				MW-187_110221				MW-187S_110221			
		Lab Sample ID:	2401593021				2401593022				2401593023			
		Sample Date:	11/2/2021				11/2/2021				11/2/2021			
Analyte	Cas No.		Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC														
OSW-8260B														
1,1-Dichloroethene	75-35-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim														
1,4-Dioxane	123-91-1						ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

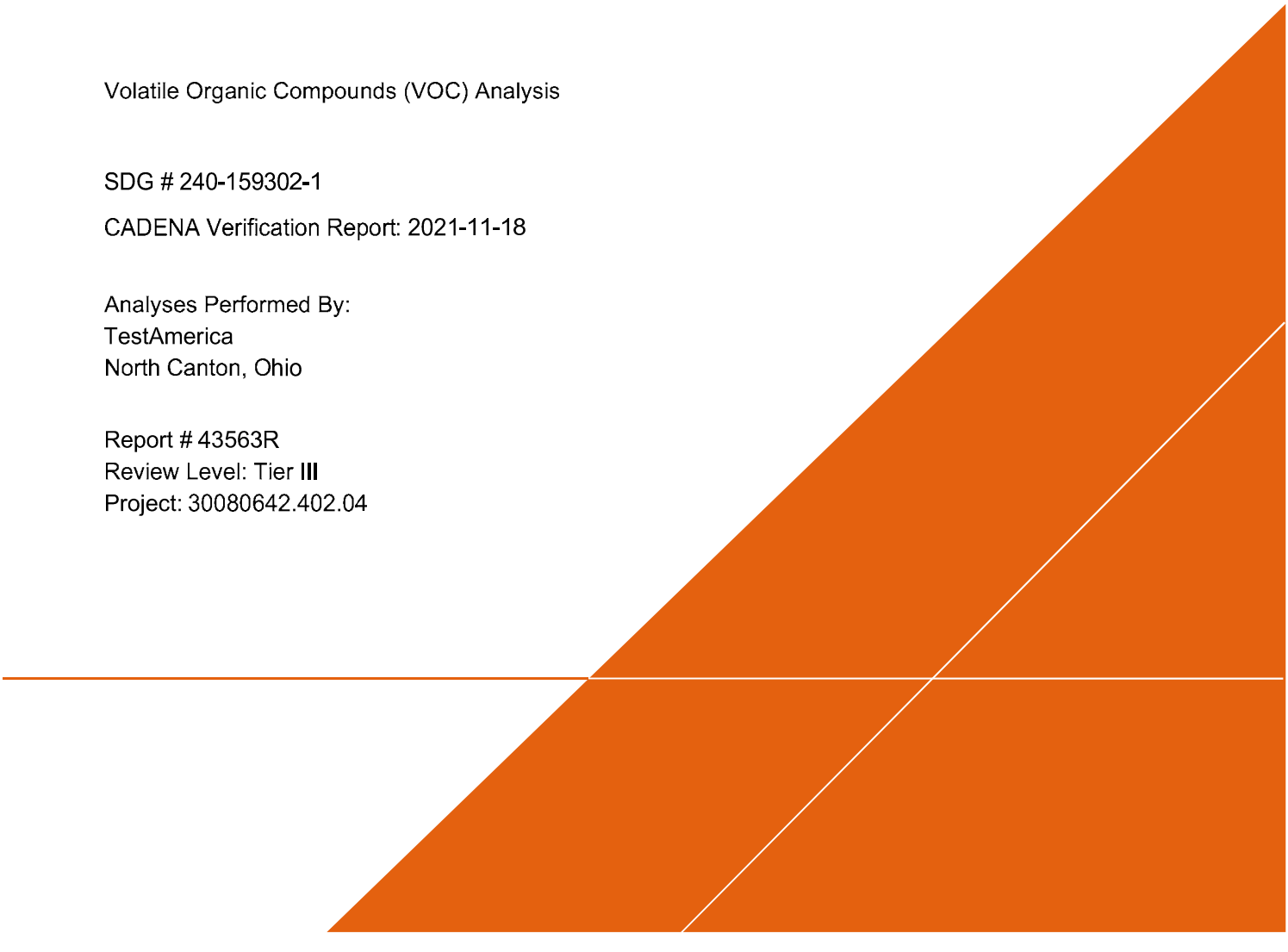
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159302-1

CADENA Verification Report: 2021-11-18

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43563R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159302-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_21	240-159302-1	Water	11/02/2021		X	
MW-187_110221	240-159302-2	Water	11/02/2021		X	X
MW-187S_110221	240-159302-3	Water	11/02/2021		X	X

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Compound	Criteria
TRIP BLANK_21 MW-187_110221 MW-187S_110221	Continuous Calibration Verification %D	trans-1,2-Dichloroethene	+21.5%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J

Initial/Continuing	Criteria	Sample Result	Qualification
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE: 

DATE: December 07, 2021

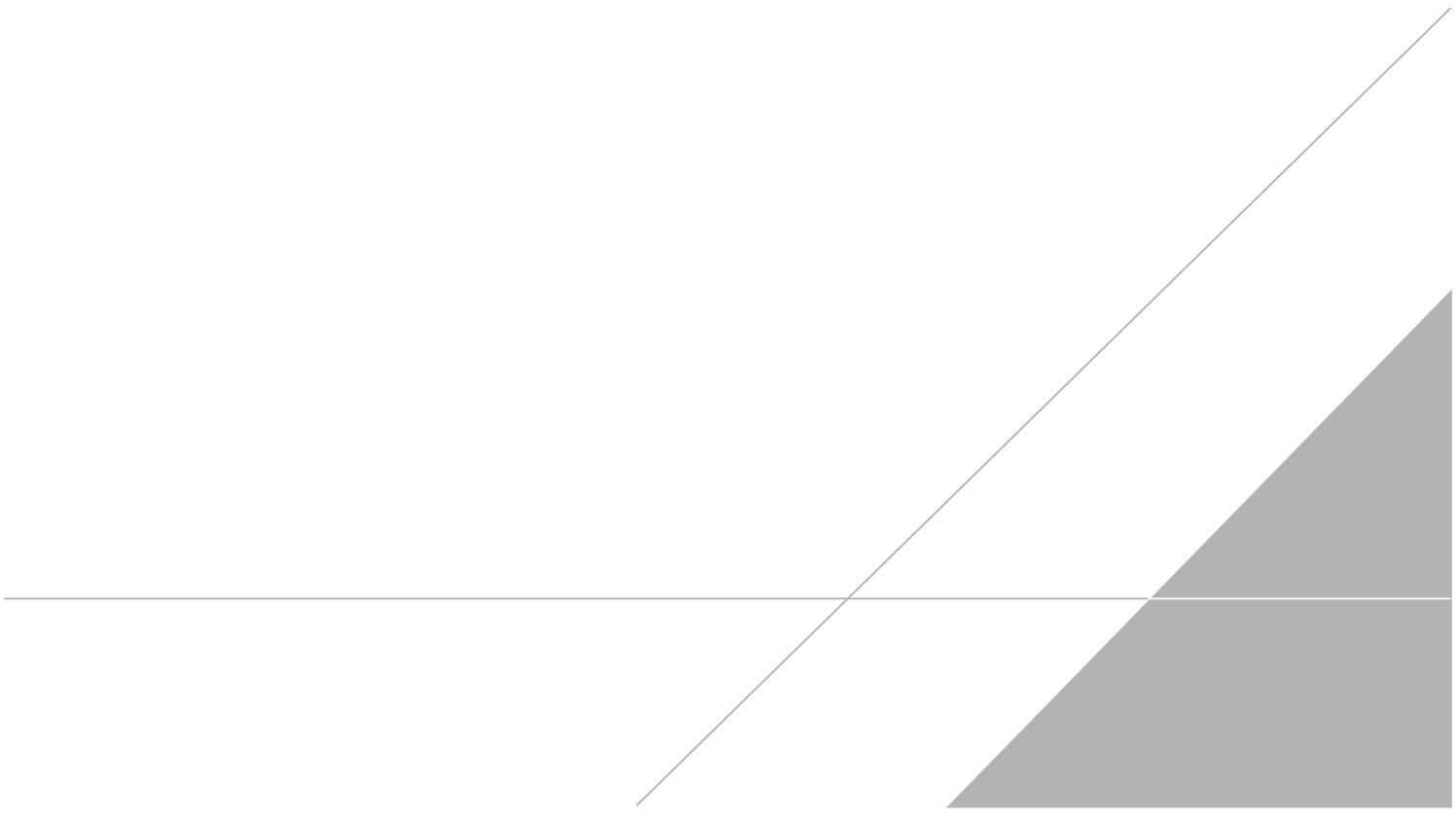
PEER REVIEW: Andrew Korycinski

DATE: December 8, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



Chain of Custody Record

MICHIGAN 190 TestAmerica

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	☐ DW ☐ NPDES ☐ RCRA ☐ Other	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500		Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377		Sampler Name: Allyson Hartz	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client:
Phone: 248-994-2240		Method of Shipment/Carrier:	10 day		Lab sampling:
Project Name: Ford LTP Off-Site		Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04					
PO # 30080642.402.04					

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_21	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-107_110221	11/2/21	11:21		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-107S_110221	11/2/21	12:25		X						6					N	G	X	X	X	X	X	X	X	↓

240-159302 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203831
Level IV Reporting requested

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Allyson Hartz	Arcadis	11/2/21 1615	Nan cold storage	Arcadis	11/2/21 1615
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	ARCADIS	11/3/21 0940	[signature]	ETA	11/3/21 946
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
[signature]	ETA	11/3/21 1006	Marcelyn Block	ETA	11-4-21 800

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11/18/2021

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159302-1

Client Sample ID: TRIP BLANK_21

Date Collected: 11/02/21 00:00
Date Received: 11/04/21 08:00

Lab Sample ID: 240-159302-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 19:18	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 19:18	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 19:18	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 19:18	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 19:18	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 19:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*122*		*62 - 137*		*11/11/21 19:18*	*1*
4-Bromofluorobenzene (Surr)	*69*		*56 - 136*		*11/11/21 19:18*	*1*
Toluene-d8 (Surr)	*90*		*78 - 122*		*11/11/21 19:18*	*1*
Dibromofluoromethane (Surr)	*108*		*73 - 120*		*11/11/21 19:18*	*1*

Client Sample ID: MW-187_110221

Date Collected: 11/02/21 11:21
Date Received: 11/04/21 08:00

Lab Sample ID: 240-159302-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/09/21 23:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*90*		*66 - 120*		*11/09/21 23:36*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 19:40	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 19:40	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 19:40	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 19:40	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 19:40	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 19:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*121*		*62 - 137*		*11/11/21 19:40*	*1*
4-Bromofluorobenzene (Surr)	*69*		*56 - 136*		*11/11/21 19:40*	*1*
Toluene-d8 (Surr)	*88*		*78 - 122*		*11/11/21 19:40*	*1*
Dibromofluoromethane (Surr)	*108*		*73 - 120*		*11/11/21 19:40*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159302-1

Client Sample ID: MW-187S_110221

Lab Sample ID: 240-159302-3

Date Collected: 11/02/21 12:25

Matrix: Water

Date Received: 11/04/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/10/21 21:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/10/21 21:46*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 20:02	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 20:02	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 20:02	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 20:02	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 20:02	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 20:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*121*		*62 - 137*		*11/11/21 20:02*	*1*
4-Bromofluorobenzene (Surr)	*67*		*56 - 136*		*11/11/21 20:02*	*1*
Toluene-d8 (Surr)	*90*		*78 - 122*		*11/11/21 20:02*	*1*
Dibromofluoromethane (Surr)	*107*		*73 - 120*		*11/11/21 20:02*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159707-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/24/2021 8:19:45 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159707-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159707-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159707-1

Comments
No additional comments.

Receipt
The samples were received on 11/10/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 0.7° C and 0.8° C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) for analytical batch 513594exceeded control criteria for Vinyl Chloride. The samples associated with this CCV were non-detect for the affected analyte. In accordance with the laboratory SOP, a low level CCV at the reporting limit (labeled as an MRL) was analyzed and the affected compounds were detected; therefore the data has been reported. No further corrective action was required: TRIP BLANK_69 (240-159707-1) and MW-186S_110821 (240-159707-2).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159707-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159707-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159707-1	TRIP BLANK_69	Water	11/08/21 00:00	11/10/21 08:00
240-159707-2	MW-186S_110821	Water	11/08/21 12:05	11/10/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159707-1

Client Sample ID: TRIP BLANK_69 — Lab Sample ID: 240-159707-1

No Detections.

Client Sample ID: MW-186S_110821 — Lab Sample ID: 240-159707-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159707-1

Client Sample ID: TRIP BLANK_69
Date Collected: 11/08/21 00:00
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159707-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 13:21	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 13:21	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 13:21	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 13:21	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 13:21	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 13:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*62 - 137*		*11/18/21 13:21*	*1*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*		*11/18/21 13:21*	*1*
Toluene-d8 (Surr)	*110*		*78 - 122*		*11/18/21 13:21*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/18/21 13:21*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159707-1

Client Sample ID: MW-186S_110821

Date Collected: 11/08/21 12:05
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159707-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 23:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*76*		*66 - 120*		*11/17/21 23:53*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 13:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 13:44	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 13:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 13:44	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 13:44	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 13:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*62 - 137*		*11/18/21 13:44*	*1*
4-Bromofluorobenzene (Surr)	*80*		*56 - 136*		*11/18/21 13:44*	*1*
Toluene-d8 (Surr)	*110*		*78 - 122*		*11/18/21 13:44*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/18/21 13:44*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159707-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159610-C-1 MS	Matrix Spike	108	90	110	99
240-159610-C-1 MSD	Matrix Spike Duplicate	103	86	103	95
240-159707-1	TRIP BLANK_69	104	87	110	101
240-159707-2	MW-186S_110821	101	80	110	100
LCS 240-513594/4	Lab Control Sample	95	85	109	92
MB 240-513594/6	Method Blank	99	77	108	96

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159636-H-2 MS	Matrix Spike	77
240-159636-N-2 MSD	Matrix Spike Duplicate	77
240-159707-2	MW-186S_110821	76
LCS 240-513479/4	Lab Control Sample	78
MB 240-513479/5	Method Blank	77

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513594/6
Matrix: Water
Analysis Batch: 513594

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 11:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 11:52	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 11:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 11:52	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 11:52	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 11:52	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/18/21 11:52*	*1*
4-Bromofluorobenzene (Surr)	*77*		*56 - 136*		*11/18/21 11:52*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/18/21 11:52*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/18/21 11:52*	*1*

Lab Sample ID: LCS 240-513594/4
Matrix: Water
Analysis Batch: 513594

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.26		ug/L		93	63 - 134
cis-1,2-Dichloroethene	10.0	11.0		ug/L		110	77 - 123
Tetrachloroethene	10.0	11.0		ug/L		110	76 - 123
trans-1,2-Dichloroethene	10.0	10.6		ug/L		106	75 - 124
Trichloroethene	10.0	8.93		ug/L		89	70 - 122
Vinyl chloride	10.0	8.24		ug/L		82	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*95*		*62 - 137*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*
Toluene-d8 (Surr)	*109*		*78 - 122*
Dibromofluoromethane (Surr)	*92*		*73 - 120*

Lab Sample ID: 240-159610-C-1 MS
Matrix: Water
Analysis Batch: 513594

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	5900		33300	38800		ug/L		99	56 - 135
cis-1,2-Dichloroethene	6900		33300	42600		ug/L		107	66 - 128
Tetrachloroethene	14000		33300	49400		ug/L		105	62 - 131
trans-1,2-Dichloroethene	3300	U	33300	34500		ug/L		103	56 - 136
Trichloroethene	2500	J	33300	33000		ug/L		92	61 - 124
Vinyl chloride	3300	U	33300	25600		ug/L		77	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*108*		*62 - 137*
4-Bromofluorobenzene (Surr)	*90*		*56 - 136*
Toluene-d8 (Surr)	*110*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159610-C-1 MS
Matrix: Water
Analysis Batch: 513594

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	99		73 - 120

Lab Sample ID: 240-159610-C-1 MSD
Matrix: Water
Analysis Batch: 513594

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	5900		33300	37600		ug/L		95	56 - 135	3	26
cis-1,2-Dichloroethene	6900		33300	38000		ug/L		93	66 - 128	11	14
Tetrachloroethene	14000		33300	47100		ug/L		99	62 - 131	5	20
trans-1,2-Dichloroethene	3300	U	33300	31300		ug/L		94	56 - 136	10	15
Trichloroethene	2500	J	33300	30800		ug/L		85	61 - 124	7	15
Vinyl chloride	3300	U	33300	25000		ug/L		75	43 - 157	2	24

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	103		62 - 137
4-Bromofluorobenzene (Surr)	86		56 - 136
Toluene-d8 (Surr)	103		78 - 122
Dibromofluoromethane (Surr)	95		73 - 120

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513479/5
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 17:41	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	77		66 - 120		11/17/21 17:41	1

Lab Sample ID: LCS 240-513479/4
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	11.9		ug/L		119	80 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	78		66 - 120

Lab Sample ID: 240-159636-H-2 MS
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

Lab Sample ID: 240-159636-N-2 MSD
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153	0	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159707-1

GC/MS VOA

Analysis Batch: 513479

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159707-2	MW-186S_110821	Total/NA	Water	8260B SIM	
MB 240-513479/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513479/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159636-H-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159636-N-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513594

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159707-1	TRIP BLANK_69	Total/NA	Water	8260B	
240-159707-2	MW-186S_110821	Total/NA	Water	8260B	
MB 240-513594/6	Method Blank	Total/NA	Water	8260B	
LCS 240-513594/4	Lab Control Sample	Total/NA	Water	8260B	
240-159610-C-1 MS	Matrix Spike	Total/NA	Water	8260B	
240-159610-C-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159707-1

Client Sample ID: TRIP BLANK_69

Lab Sample ID: 240-159707-1

Date Collected: 11/08/21 00:00

Matrix: Water

Date Received: 11/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513594	11/18/21 13:21	LEE	TAL CAN

Client Sample ID: MW-186S_110821

Lab Sample ID: 240-159707-2

Date Collected: 11/08/21 12:05

Matrix: Water

Date Received: 11/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513594	11/18/21 13:44	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513479	11/17/21 23:53	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159707-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No: 1 of 1 COCs
Phone: 248-994-2240	Sampler Name: Seth Turner	TAT if different from below	For lab use only
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:	10 day / 3 weeks / 2 weeks / 1 week / 2 days / 1 day	Walk-in client
Project Number: 30080642.402.04	Shipping/Tracking No:		Lab sampling
PO # 30080642.402.04			Job/SDG No:

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_69	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1865_110821	11/8/21	1205		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159707 Chain of Custody

Possible Hazard Identification: Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / Disposal By Lab / Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company:	Date/Time:		Company:	Date/Time:
Relinquished by: Seth Turner	Arcadis	11/8/21 1330	Received by: Novi cold storage	Arcadis	11/8/21 1330
Relinquished by:	ARCADIS	11/9/21 1040	Received by:	ETA	11/9/21 1040
Relinquished by:	ETA	11/9/21 1055	Received in Laboratory by: Mandy Bleau	ETA	11-10-21 8:00

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11/24/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159702**
Canton Facility

Client Arcadis Site Name

Cooler Received on 11-10-21 Opened on 11-10-21

Cooler unpacked by: Mandolyn Beach

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TB Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity_____	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC157842
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #_____	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

No SIM on TB per Corrected COC

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) TripblANK - 69 were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

Login # : 159707

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form				
Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
TA Client Box Other	IR-14 IR-15	0-6	0-7	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15	0-7	0-8	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15	

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 240-159707-1

Login Number: 159707
List Number: 1
Creator: Snyder, Matthew

List Source: Eurofins TestAmerica, Canton

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.		
The cooler's custody seal, if present, is intact.		
Sample custody seals, if present, are intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the containers received and the COC.		
Samples are received within Holding Time (excluding tests with immediate HTs)		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified.		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Residual Chlorine Checked.		

DATA VERIFICATION REPORT

November 25, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159707-1
Sample date: 2021-11-08
Report received by CADENA: 2021-11-24
Initial Data Verification completed by CADENA: 2021-11-25
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159707-1

		Sample Name:	TRIP BLANK_69				MW-186S_110821			
		Lab Sample ID:	2401597071				2401597072			
		Sample Date:	11/8/2021				11/8/2021			
	Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC										
	OSW-8260B									
	1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	OSW-8260BBSim									
	1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

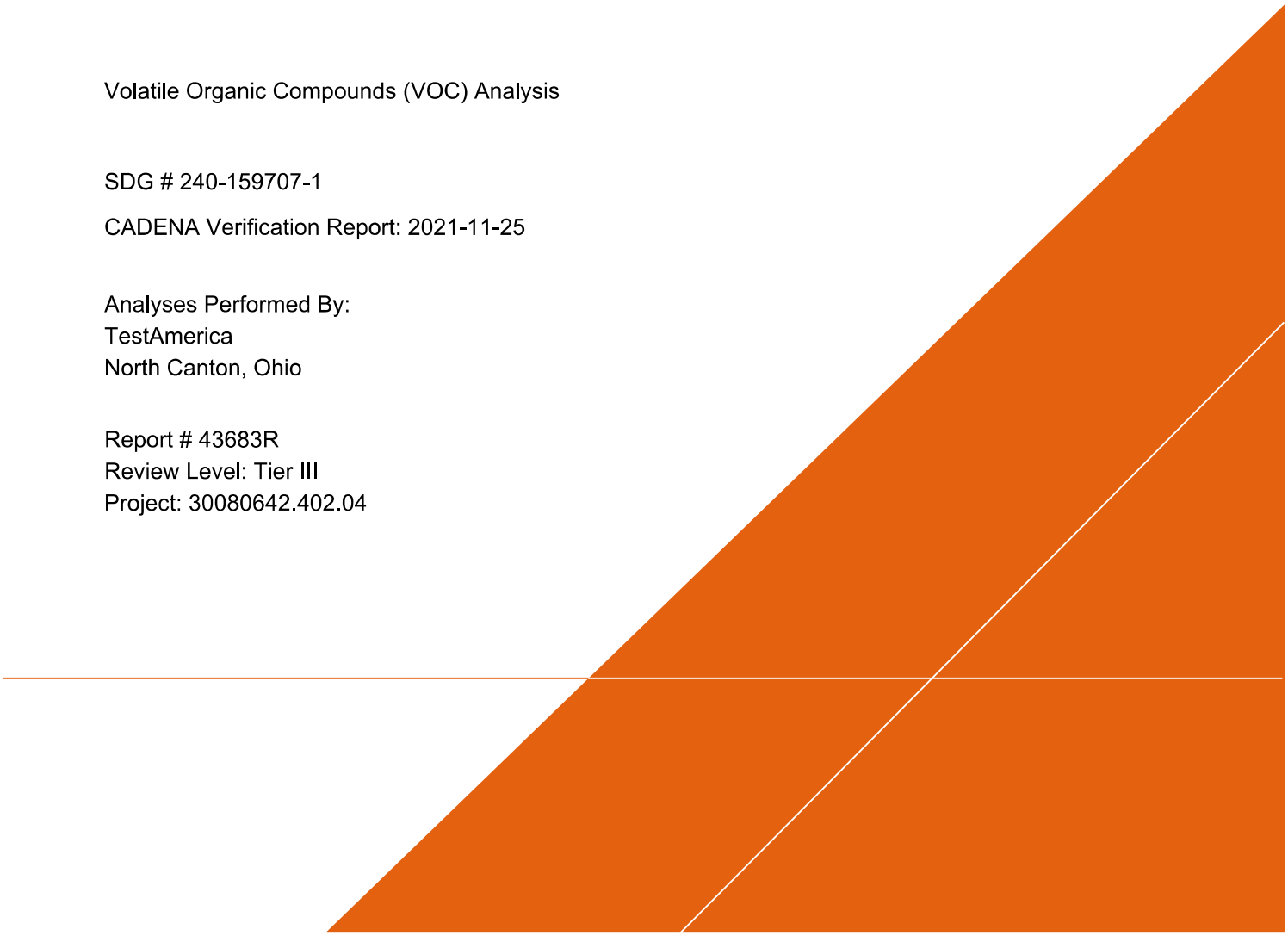
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159707-1

CADENA Verification Report: 2021-11-25

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43683R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159707-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_69	240-159707-1	Water	11/08/21		X	
MW-186S_110821	240-159707-2	Water	11/08/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Compound	Criteria
TRIP BLANK_69 MW-186S_110821	Continuous Calibration Verification %D	Vinyl chloride	-22.1%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	

Initial/Continuing	Criteria	Sample Result	Qualification
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 10, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 14, 2021

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Seth Turner	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_69	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1865_110821	11/8/21	1205		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159707 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	11/8/21 1330	Novi cold Storage	Arcadis	11/8/21 1330
[signature]	ARCADIS	11/9/21 1040	[signature]	ETA	11/9/21 1040
[signature]	ETA	11/9/21 1055	Mandy Bleau	ETA	11-10-21 8:00

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Client Sample ID: TRIP BLANK_69
Lab Sample ID: 240-159707-1
Date Collected: 11/08/21 00:00
Matrix: Water
Date Received: 11/10/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 13:21	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 13:21	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 13:21	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 13:21	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 13:21	1
Vinyl chloride	1.0	~~U~~ UJ	1.0	0.45	ug/L			11/18/21 13:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*62 - 137*		*11/18/21 13:21*	*1*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*		*11/18/21 13:21*	*1*
Toluene-d8 (Surr)	*110*		*78 - 122*		*11/18/21 13:21*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/18/21 13:21*	*1*

Client Sample ID: MW-186S_110821
Lab Sample ID: 240-159707-2
Date Collected: 11/08/21 12:05
Matrix: Water
Date Received: 11/10/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 23:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*76*		*66 - 120*		*11/17/21 23:53*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 13:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 13:44	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 13:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 13:44	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 13:44	1
Vinyl chloride	1.0	~~U~~ UJ	1.0	0.45	ug/L			11/18/21 13:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*62 - 137*		*11/18/21 13:44*	*1*
4-Bromofluorobenzene (Surr)	*80*		*56 - 136*		*11/18/21 13:44*	*1*
Toluene-d8 (Surr)	*110*		*78 - 122*		*11/18/21 13:44*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/18/21 13:44*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-160203-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/30/2021 2:45:33 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160203-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-160203-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-160203-1

Comments
No additional comments.

Receipt
The samples were received on 11/17/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.3° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160203-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160203-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-160203-1	TRIP BLANK_133	Water	11/15/21 00:00	11/17/21 08:00
240-160203-2	MW-166S_111521	Water	11/15/21 15:25	11/17/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160203-1

Client Sample ID: TRIP BLANK_133 — Lab Sample ID: 240-160203-1

No Detections.

Client Sample ID: MW-166S_111521 — Lab Sample ID: 240-160203-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160203-1

Client Sample ID: TRIP BLANK_133
Date Collected: 11/15/21 00:00
Date Received: 11/17/21 08:00

Lab Sample ID: 240-160203-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/23/21 20:20	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/23/21 20:20	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/23/21 20:20	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/23/21 20:20	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/23/21 20:20	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/23/21 20:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*		*11/23/21 20:20*	*1*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*		*11/23/21 20:20*	*1*
Toluene-d8 (Surr)	*101*		*78 - 122*		*11/23/21 20:20*	*1*
Dibromofluoromethane (Surr)	*107*		*73 - 120*		*11/23/21 20:20*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160203-1

Client Sample ID: MW-166S_111521
Date Collected: 11/15/21 15:25
Date Received: 11/17/21 08:00

Lab Sample ID: 240-160203-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/19/21 03:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*66 - 120*		*11/19/21 03:45*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/23/21 23:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/23/21 23:06	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/23/21 23:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/23/21 23:06	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/23/21 23:06	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/23/21 23:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*62 - 137*		*11/23/21 23:06*	*1*
4-Bromofluorobenzene (Surr)	*93*		*56 - 136*		*11/23/21 23:06*	*1*
Toluene-d8 (Surr)	*100*		*78 - 122*		*11/23/21 23:06*	*1*
Dibromofluoromethane (Surr)	*105*		*73 - 120*		*11/23/21 23:06*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160203-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-160203-1	TRIP BLANK_133	102	94	101	107
240-160203-2	MW-166S_111521	101	93	100	105
240-160551-B-10 MS	Matrix Spike	95	95	104	104
240-160551-B-10 MSD	Matrix Spike Duplicate	93	98	106	103
LCS 240-514335/5	Lab Control Sample	90	94	98	103
MB 240-514335/8	Method Blank	92	89	95	101

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-160158-G-2 MS	Matrix Spike	90
240-160158-M-2 MSD	Matrix Spike Duplicate	92
240-160203-2	MW-166S_111521	93
LCS 240-513701/4	Lab Control Sample	88
MB 240-513701/5	Method Blank	85

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-514335/8
Matrix: Water
Analysis Batch: 514335

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/23/21 15:59	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/23/21 15:59	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/23/21 15:59	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/23/21 15:59	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/23/21 15:59	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/23/21 15:59	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/23/21 15:59*	*1*
4-Bromofluorobenzene (Surr)	*89*		*56 - 136*		*11/23/21 15:59*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*11/23/21 15:59*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/23/21 15:59*	*1*

Lab Sample ID: LCS 240-514335/5
Matrix: Water
Analysis Batch: 514335

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	25.7		ug/L		103	63 - 134
cis-1,2-Dichloroethene	25.0	23.8		ug/L		95	77 - 123
Tetrachloroethene	25.0	26.5		ug/L		106	76 - 123
trans-1,2-Dichloroethene	25.0	24.4		ug/L		98	75 - 124
Trichloroethene	25.0	25.1		ug/L		101	70 - 122
Vinyl chloride	25.0	20.3		ug/L		81	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*
Toluene-d8 (Surr)	*98*		*78 - 122*
Dibromofluoromethane (Surr)	*103*		*73 - 120*

Lab Sample ID: 240-160551-B-10 MS
Matrix: Water
Analysis Batch: 514335

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	250	U	6250	6360		ug/L		102	56 - 135
cis-1,2-Dichloroethene	250	U	6250	5850		ug/L		94	66 - 128
Tetrachloroethene	250	U	6250	6810		ug/L		109	62 - 131
trans-1,2-Dichloroethene	250	U	6250	6190		ug/L		99	56 - 136
Trichloroethene	250	U	6250	6660		ug/L		107	61 - 124
Vinyl chloride	250	U	6250	5070		ug/L		81	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*95*		*62 - 137*
4-Bromofluorobenzene (Surr)	*95*		*56 - 136*
Toluene-d8 (Surr)	*104*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-160551-B-10 MS
Matrix: Water
Analysis Batch: 514335

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*104*		*73 - 120*

Lab Sample ID: 240-160551-B-10 MSD
Matrix: Water
Analysis Batch: 514335

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	250	U	6250	6130		ug/L		98	56 - 135	4	26
cis-1,2-Dichloroethene	250	U	6250	5840		ug/L		93	66 - 128	0	14
Tetrachloroethene	250	U	6250	6750		ug/L		108	62 - 131	1	20
trans-1,2-Dichloroethene	250	U	6250	6000		ug/L		96	56 - 136	3	15
Trichloroethene	250	U	6250	6420		ug/L		103	61 - 124	4	15
Vinyl chloride	250	U	6250	4950		ug/L		79	43 - 157	2	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*98*		*56 - 136*
Toluene-d8 (Surr)	*106*		*78 - 122*
Dibromofluoromethane (Surr)	*103*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513701/5
Matrix: Water
Analysis Batch: 513701

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 19:39	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/18/21 19:39*	*1*

Lab Sample ID: LCS 240-513701/4
Matrix: Water
Analysis Batch: 513701

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.2		ug/L		102	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*66 - 120*

Lab Sample ID: 240-160158-G-2 MS
Matrix: Water
Analysis Batch: 513701

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*90*		*66 - 120*

Lab Sample ID: 240-160158-M-2 MSD
Matrix: Water
Analysis Batch: 513701

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.5		ug/L		105	51 - 153	1	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*92*		*66 - 120*

GC/MS VOA

Analysis Batch: 513701

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-160203-2	MW-166S_111521	Total/NA	Water	8260B SIM	
MB 240-513701/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513701/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-160158-G-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-160158-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 514335

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-160203-1	TRIP BLANK_133	Total/NA	Water	8260B	
240-160203-2	MW-166S_111521	Total/NA	Water	8260B	
MB 240-514335/8	Method Blank	Total/NA	Water	8260B	
LCS 240-514335/5	Lab Control Sample	Total/NA	Water	8260B	
240-160551-B-10 MS	Matrix Spike	Total/NA	Water	8260B	
240-160551-B-10 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160203-1

Client Sample ID: TRIP BLANK_133

Lab Sample ID: 240-160203-1

Date Collected: 11/15/21 00:00

Matrix: Water

Date Received: 11/17/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	514335	11/23/21 20:20	SAM	TAL CAN

Client Sample ID: MW-166S_111521

Lab Sample ID: 240-160203-2

Date Collected: 11/15/21 15:25

Matrix: Water

Date Received: 11/17/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	514335	11/23/21 23:06	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	513701	11/19/21 03:45	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160203-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Pittsburgh — 10AB Canton Drive, Suite 200 / Monroeville, PA 15146 / 412-325-2742

Regulatory program: DW NPDES RCRA Other:

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Kim Hanley	Site Contact: Jodie McClatchey	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-844-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kimberly.hanley@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler: Name:	TAT if different from Below		Walk-in client
Phone: 248-994-2240	Shipment for Shipment Carrier:	10 day — 3 weeks / 2 weeks / 1 week / 3 days / 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No.:
Project Number: 30004847.0004				
PO #: 30004847.0004				

Sample Identification	Sample Date	Sample Time	Matrix: Air / Aqueous / Sediment / Solid / Other	Containers & Preservatives: HNO3 / H2SO4 / HCl / NaOH / ZnAc / NaHSO4 / Unpres / Other	Filtered Sample (Y / N)	Perform MS/MSD (Y / N)	Analysis: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM				Sample Specific Notes / Special Instructions:
TRIP BLANK_130	—	—	X				X	X	X	X	X	X	X				1 Trip Blank
MW-MW-WS_111521	11/15/21	10:45	W	1	N	N	X	X	X	X	X	X	X				6 VOAs for 8260B 3 VOAs for 8260B SIM

240-160203 Chain of Custody

Possible Hazard Identification: Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / Disposal by Lab / Archive for ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Central Submission — Criteria 6E10343

Level IV Reporting required

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 160203**
Canton Facility

Client Arcadis Site Name

Cooler Received on 11/17/21 Opened on 11/17/21

Cooler unpacked by Trent

FedEx. 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # 164 Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT. (Wet Ice) Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.2 °C Corrected Cooler Temp. 0.3 °C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp ____ °C Corrected Cooler Temp. ____ °C

2 Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3 Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4 Did custody papers accompany the sample(s)?	(Yes)	No
5 Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6 Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7 Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8 Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?	(Y)	N
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# HC157842
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this	Yes	(No) NA
16 Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 01042016	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by

No SIM on TB per corrected COC. mm 11/17/21

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.

Sample(s) ____ were received in a broken container

Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory

Time preserved. ____ Preservative(s) added/Lot number(s). ____

VOA Sample Preservation - Date/Time VOAs Frozen ____

DATA VERIFICATION REPORT

November 30, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 160203-1
Sample date: 2021-11-15
Report received by CADENA: 2021-11-30
Initial Data Verification completed by CADENA: 2021-11-30
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 160203-1

		Sample Name:	TRIP BLANK_133				MW-166S_111521			
		Lab Sample ID:	2401602031				2401602032			
		Sample Date:	11/15/2021				11/15/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

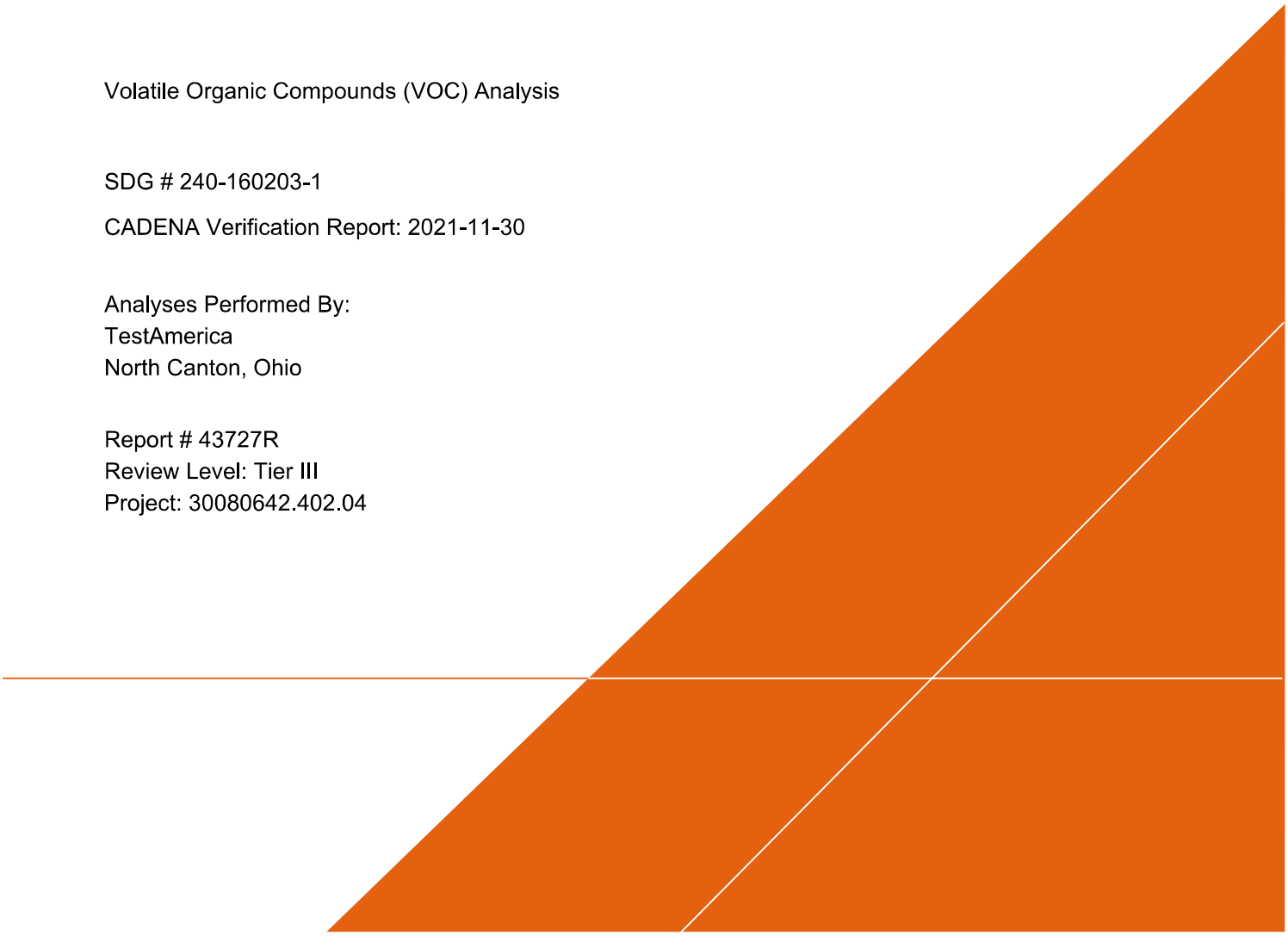
Volatile Organic Compounds (VOC) Analysis

SDG # 240-160203-1

CADENA Verification Report: 2021-11-30

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43727R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-160203-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_133	240-160203-1	Water	11/15/21		X	
MW-166S_111521	240-160203-2	Water	11/15/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	DW / NPDES / RCRA / Other	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500		Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377		Sampler Name: Sam Mitchell COURIER: CHRISTINA WERNER	TAT if different from below: 10 day ✓ 2 weeks / 3 weeks / 1 week / 2 days / 1 day		Walk-in client
Phone: 248-994-2240		Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site		Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04					
PO # 30080642.402.04					

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_133	—	—		X						1					N	C	X	X	X	X	X	X	X	1 Trip Blank
MW-1605_111521	11/15/21	15:25		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-160203 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / ✓ Disposal By Lab / Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested

Relinquished by:	Company	Date/Time:	Received by:	Company	Date/Time:
Sam Mitchell	Arcadis	11/15/21 16:45	Novi, cold storage	Arcadis	11/15/21 16:45
Relinquished by:	Company: ARCADIS	Date/Time: 11/16/21 1043	Received by:	Company: ETA	Date/Time: 11/16/21 1043
Relinquished by:	Company: ETA	Date/Time: 11/16/21	Received in Laboratory by:	Company: ETA	Date/Time: 11/17/21 800

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Client Sample ID: TRIP BLANK_133
Lab Sample ID: 240-160203-1
Date Collected: 11/15/21 00:00
Matrix: Water
Date Received: 11/17/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/23/21 20:20	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/23/21 20:20	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/23/21 20:20	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/23/21 20:20	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/23/21 20:20	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/23/21 20:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*		*11/23/21 20:20*	*1*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*		*11/23/21 20:20*	*1*
Toluene-d8 (Surr)	*101*		*78 - 122*		*11/23/21 20:20*	*1*
Dibromofluoromethane (Surr)	*107*		*73 - 120*		*11/23/21 20:20*	*1*

Client Sample ID: MW-166S_111521
Lab Sample ID: 240-160203-2
Date Collected: 11/15/21 15:25
Matrix: Water
Date Received: 11/17/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/19/21 03:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*66 - 120*		*11/19/21 03:45*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/23/21 23:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/23/21 23:06	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/23/21 23:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/23/21 23:06	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/23/21 23:06	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/23/21 23:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*62 - 137*		*11/23/21 23:06*	*1*
4-Bromofluorobenzene (Surr)	*93*		*56 - 136*		*11/23/21 23:06*	*1*
Toluene-d8 (Surr)	*100*		*78 - 122*		*11/23/21 23:06*	*1*
Dibromofluoromethane (Surr)	*105*		*73 - 120*		*11/23/21 23:06*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159619-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/22/2021 3:37:02 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

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Visit us at:
www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159619-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159619-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159619-1

Comments
No additional comments.

Receipt
The samples were received on 11/9/2021 10:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 3.7° C and 3.8° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159619-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159619-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159619-1	TRIP BLANK_64	Water	11/05/21 00:00	11/09/21 10:00
240-159619-2	MW-160S_110521	Water	11/05/21 10:13	11/09/21 10:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159619-1

Client Sample ID: TRIP BLANK_64 — Lab Sample ID: 240-159619-1

No Detections.

Client Sample ID: MW-160S_110521 — Lab Sample ID: 240-159619-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159619-1

Client Sample ID: TRIP BLANK_64
Date Collected: 11/05/21 00:00
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159619-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 16:05	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 16:05	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 16:05	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 16:05	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 16:05	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 16:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/16/21 16:05*	*1*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*		*11/16/21 16:05*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*11/16/21 16:05*	*1*
Dibromofluoromethane (Surr)	*105*		*73 - 120*		*11/16/21 16:05*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159619-1

Client Sample ID: MW-160S_110521

Lab Sample ID: 240-159619-2

Date Collected: 11/05/21 10:13

Matrix: Water

Date Received: 11/09/21 10:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/16/21 22:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*11/16/21 22:11*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 19:37	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 19:37	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 19:37	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 19:37	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 19:37	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 19:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/16/21 19:37*	*1*
4-Bromofluorobenzene (Surr)	*91*		*56 - 136*		*11/16/21 19:37*	*1*
Toluene-d8 (Surr)	*101*		*78 - 122*		*11/16/21 19:37*	*1*
Dibromofluoromethane (Surr)	*115*		*73 - 120*		*11/16/21 19:37*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159619-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159619-1	TRIP BLANK_64	93	85	95	105
240-159619-2	MW-160S_110521	105	91	101	115
240-159636-F-2 MS	Matrix Spike	93	93	102	105
240-159636-G-2 MSD	Matrix Spike Duplicate	93	94	103	105
LCS 240-513208/5	Lab Control Sample	86	91	100	101
MB 240-513208/8	Method Blank	91	87	98	108

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159546-G-2 MS	Matrix Spike	82
240-159546-M-2 MSD	Matrix Spike Duplicate	85
240-159619-2	MW-160S_110521	82
LCS 240-513286/4	Lab Control Sample	82
MB 240-513286/5	Method Blank	85

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513208/8
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 14:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 14:06	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 14:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 14:06	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 14:06	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 14:06	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*62 - 137*		*11/16/21 14:06*	*1*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*		*11/16/21 14:06*	*1*
Toluene-d8 (Surr)	*98*		*78 - 122*		*11/16/21 14:06*	*1*
Dibromofluoromethane (Surr)	*108*		*73 - 120*		*11/16/21 14:06*	*1*

Lab Sample ID: LCS 240-513208/5
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	28.3		ug/L		113	63 - 134
cis-1,2-Dichloroethene	25.0	26.1		ug/L		104	77 - 123
Tetrachloroethene	25.0	29.3		ug/L		117	76 - 123
trans-1,2-Dichloroethene	25.0	27.4		ug/L		110	75 - 124
Trichloroethene	25.0	27.4		ug/L		110	70 - 122
Vinyl chloride	25.0	24.0		ug/L		96	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*
4-Bromofluorobenzene (Surr)	*91*		*56 - 136*
Toluene-d8 (Surr)	*100*		*78 - 122*
Dibromofluoromethane (Surr)	*101*		*73 - 120*

Lab Sample ID: 240-159636-F-2 MS
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	25.0	25.8		ug/L		103	56 - 135
cis-1,2-Dichloroethene	1.0	U	25.0	24.8		ug/L		99	66 - 128
Tetrachloroethene	1.0	U	25.0	28.9		ug/L		116	62 - 131
trans-1,2-Dichloroethene	1.0	U	25.0	25.3		ug/L		101	56 - 136
Trichloroethene	1.0	U	25.0	25.4		ug/L		101	61 - 124
Vinyl chloride	1.0	U	25.0	22.2		ug/L		89	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*93*		*56 - 136*
Toluene-d8 (Surr)	*102*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159636-F-2 MS
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	*105*		*73 - 120*

Lab Sample ID: 240-159636-G-2 MSD
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	25.0	25.9		ug/L		104	56 - 135	0	26
cis-1,2-Dichloroethene	1.0	U	25.0	25.0		ug/L		100	66 - 128	1	14
Tetrachloroethene	1.0	U	25.0	29.5		ug/L		118	62 - 131	2	20
trans-1,2-Dichloroethene	1.0	U	25.0	25.1		ug/L		100	56 - 136	1	15
Trichloroethene	1.0	U	25.0	25.3		ug/L		101	61 - 124	0	15
Vinyl chloride	1.0	U	25.0	22.3		ug/L		89	43 - 157	1	24

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*
Toluene-d8 (Surr)	*103*		*78 - 122*
Dibromofluoromethane (Surr)	*105*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513286/5
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/16/21 19:44	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/16/21 19:44*	*1*

Lab Sample ID: LCS 240-513286/4
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.78		ug/L		98	80 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159546-G-2 MS
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	11.0		ug/L		110	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159546-M-2 MSD
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.83		ug/L		98	51 - 153	11	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159619-1

GC/MS VOA

Analysis Batch: 513208

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159619-1	TRIP BLANK_64	Total/NA	Water	8260B	
240-159619-2	MW-160S_110521	Total/NA	Water	8260B	
MB 240-513208/8	Method Blank	Total/NA	Water	8260B	
LCS 240-513208/5	Lab Control Sample	Total/NA	Water	8260B	
240-159636-F-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159636-G-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 513286

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159619-2	MW-160S_110521	Total/NA	Water	8260B SIM	
MB 240-513286/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513286/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159546-G-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159546-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159619-1

Client Sample ID: TRIP BLANK_64

Lab Sample ID: 240-159619-1

Date Collected: 11/05/21 00:00

Matrix: Water

Date Received: 11/09/21 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513208	11/16/21 16:05	SAM	TAL CAN

Client Sample ID: MW-160S_110521

Lab Sample ID: 240-159619-2

Date Collected: 11/05/21 10:13

Matrix: Water

Date Received: 11/09/21 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513208	11/16/21 19:37	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	513286	11/16/21 22:11	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159619-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

MICHIGAN TestAmerica
190
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Andrew Barritt	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_64	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1605_110521	11/5/21	1013		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159619 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by:	Arcadis	11/5/21 1500	Received by: Novi Cold Storage	Arcadis	11/5/21 1600
Relinquished by:	ARCADIS	11/8/21 / 1200	Received by:	ETA	11/8/21 1200
Relinquished by:	ETA	11/8/21	Received in Laboratory by:	ETA	11-9-21 1000

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 159619
Canton Facility

Client ARCADIS Site Name _____ Cooler unpacked by: Tammy Dayer

Cooler Received on 11-9-21 Opened on 11-9-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 2 Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
   -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? Yes No
11. Sufficient quantity received to perform indicated analyses? Yes No yes 11/11/21
12. Are these work share samples and all listed on the COC? Yes No
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# **HC157842**
14. Were VOAs on the COC? Yes No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 60358 Yes No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page | Samples processed by:

The TB is not logged for STM ~~due to insufficient volume~~ per corrected COC. 11/11/21 ~~11-9-21~~

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

WI-NC-099

Login # : 159619

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form				
Cooler Description (Circle)	**IR Gun # (Circle)**	**Observed Temp °C**	**Corrected Temp °C**	**Coolant (Circle)**
(TA) Client Box Other	(IR-14) IR-15	3.6	3.7	(Wet Ice) Blue Ice Dry Ice Water None
(TA) Client Box Other	(IR-14) IR-15	3.7	3.8	(Wet Ice) Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice

DATA VERIFICATION REPORT

November 22, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159619-1
Sample date: 2021-11-05
Report received by CADENA: 2021-11-22
Initial Data Verification completed by CADENA: 2021-11-22
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159619-1

		Sample Name:	TRIP BLANK_64				MW-160S_110521			
		Lab Sample ID:	2401596191				2401596192			
		Sample Date:	11/5/2021				11/5/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

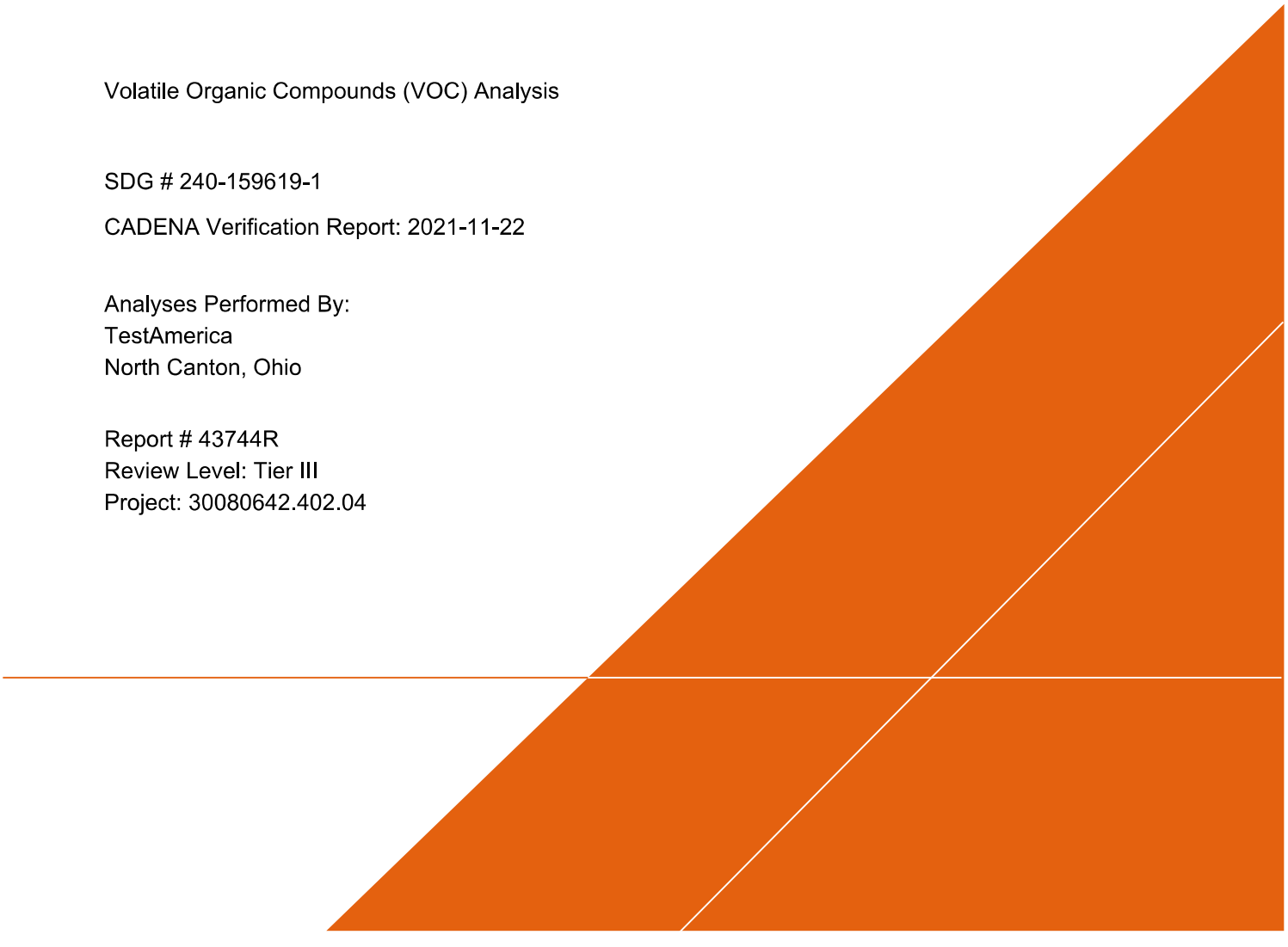
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159619-1

CADENA Verification Report: 2021-11-22

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43744R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159619-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_64	240-159619-1	Water	11/05/21		X	
MW-160S_110521	240-159619-2	Water	11/05/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190 TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Andrew Barritt		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30080642.402.04	Shipping/Tracking No:		
PO # 30080642.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below: 10 day

☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day

Analyses

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 64	---	---		X						1					N	G	X	X	X	X	X	X	~~X~~	1 Trip Blank
MW-1605_110521	11/5/21	1013		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159619 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	11/5/21 1500	Novi Cold storage	Arcadis	11/5/21 1500
[signature]	ARCADIS	11/8/21 / 1200	[signature]	ETA	11/8/21 1200
[signature]	ETA	11/8/21	Received in Laboratory by: [signature]	ETA	11-9-21 1000

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11/22/2021

Client Sample ID: TRIP BLANK_64
Lab Sample ID: 240-159619-1
Date Collected: 11/05/21 00:00
Matrix: Water
Date Received: 11/09/21 10:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 16:05	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 16:05	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 16:05	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 16:05	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 16:05	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 16:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/16/21 16:05*	*1*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*		*11/16/21 16:05*	*1*
Toluene-d8 (Surr)	*95*		*78 - 122*		*11/16/21 16:05*	*1*
Dibromofluoromethane (Surr)	*105*		*73 - 120*		*11/16/21 16:05*	*1*

Client Sample ID: MW-160S_110521
Lab Sample ID: 240-159619-2
Date Collected: 11/05/21 10:13
Matrix: Water
Date Received: 11/09/21 10:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/16/21 22:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*11/16/21 22:11*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 19:37	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 19:37	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 19:37	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 19:37	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 19:37	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 19:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/16/21 19:37*	*1*
4-Bromofluorobenzene (Surr)	*91*		*56 - 136*		*11/16/21 19:37*	*1*
Toluene-d8 (Surr)	*101*		*78 - 122*		*11/16/21 19:37*	*1*
Dibromofluoromethane (Surr)	*115*		*73 - 120*		*11/16/21 19:37*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159618-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/22/2021 3:34:07 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159618-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159618-1

Job ID: 240-159618-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159618-1

Comments
No additional comments.

Receipt
The samples were received on 11/9/2021 10:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 3.7º C and 3.8º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159618-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159618-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159618-1	TRIP BLANK_65	Water	11/05/21 00:00	11/09/21 10:00
240-159618-2	MW-95S_110521	Water	11/05/21 11:23	11/09/21 10:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159618-1

Client Sample ID: TRIP BLANK_65 — Lab Sample ID: 240-159618-1

No Detections.

Client Sample ID: MW-95S_110521 — Lab Sample ID: 240-159618-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159618-1

Client Sample ID: TRIP BLANK_65
Date Collected: 11/05/21 00:00
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159618-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 15:41	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 15:41	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 15:41	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 15:41	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 15:41	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 15:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*62 - 137*		*11/16/21 15:41*	*1*
4-Bromofluorobenzene (Surr)	*88*		*56 - 136*		*11/16/21 15:41*	*1*
Toluene-d8 (Surr)	*97*		*78 - 122*		*11/16/21 15:41*	*1*
Dibromofluoromethane (Surr)	*108*		*73 - 120*		*11/16/21 15:41*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159618-1

Client Sample ID: MW-95S_110521
Date Collected: 11/05/21 11:23
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159618-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/13/21 02:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/13/21 02:50*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 19:13	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 19:13	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 19:13	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 19:13	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 19:13	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 19:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*107*		*62 - 137*		*11/16/21 19:13*	*1*
4-Bromofluorobenzene (Surr)	*92*		*56 - 136*		*11/16/21 19:13*	*1*
Toluene-d8 (Surr)	*99*		*78 - 122*		*11/16/21 19:13*	*1*
Dibromofluoromethane (Surr)	*117*		*73 - 120*		*11/16/21 19:13*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159618-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159618-1	TRIP BLANK_65	97	88	97	108
240-159618-2	MW-95S_110521	107	92	99	117
240-159636-F-2 MS	Matrix Spike	93	93	102	105
240-159636-G-2 MSD	Matrix Spike Duplicate	93	94	103	105
LCS 240-513208/5	Lab Control Sample	86	91	100	101
MB 240-513208/8	Method Blank	91	87	98	108

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159543-G-3 MS	Matrix Spike	85
240-159543-O-3 MSD	Matrix Spike Duplicate	83
240-159618-2	MW-95S_110521	85
LCS 240-512758/4	Lab Control Sample	83
MB 240-512758/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513208/8
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 14:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 14:06	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 14:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 14:06	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 14:06	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 14:06	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*62 - 137*		*11/16/21 14:06*	*1*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*		*11/16/21 14:06*	*1*
Toluene-d8 (Surr)	*98*		*78 - 122*		*11/16/21 14:06*	*1*
Dibromofluoromethane (Surr)	*108*		*73 - 120*		*11/16/21 14:06*	*1*

Lab Sample ID: LCS 240-513208/5
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	28.3		ug/L		113	63 - 134
cis-1,2-Dichloroethene	25.0	26.1		ug/L		104	77 - 123
Tetrachloroethene	25.0	29.3		ug/L		117	76 - 123
trans-1,2-Dichloroethene	25.0	27.4		ug/L		110	75 - 124
Trichloroethene	25.0	27.4		ug/L		110	70 - 122
Vinyl chloride	25.0	24.0		ug/L		96	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*
4-Bromofluorobenzene (Surr)	*91*		*56 - 136*
Toluene-d8 (Surr)	*100*		*78 - 122*
Dibromofluoromethane (Surr)	*101*		*73 - 120*

Lab Sample ID: 240-159636-F-2 MS
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	25.0	25.8		ug/L		103	56 - 135
cis-1,2-Dichloroethene	1.0	U	25.0	24.8		ug/L		99	66 - 128
Tetrachloroethene	1.0	U	25.0	28.9		ug/L		116	62 - 131
trans-1,2-Dichloroethene	1.0	U	25.0	25.3		ug/L		101	56 - 136
Trichloroethene	1.0	U	25.0	25.4		ug/L		101	61 - 124
Vinyl chloride	1.0	U	25.0	22.2		ug/L		89	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*93*		*56 - 136*
Toluene-d8 (Surr)	*102*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159636-F-2 MS
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*105*		*73 - 120*

Lab Sample ID: 240-159636-G-2 MSD
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	25.0	25.9		ug/L		104	56 - 135	0	26
cis-1,2-Dichloroethene	1.0	U	25.0	25.0		ug/L		100	66 - 128	1	14
Tetrachloroethene	1.0	U	25.0	29.5		ug/L		118	62 - 131	2	20
trans-1,2-Dichloroethene	1.0	U	25.0	25.1		ug/L		100	56 - 136	1	15
Trichloroethene	1.0	U	25.0	25.3		ug/L		101	61 - 124	0	15
Vinyl chloride	1.0	U	25.0	22.3		ug/L		89	43 - 157	1	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*
Toluene-d8 (Surr)	*103*		*78 - 122*
Dibromofluoromethane (Surr)	*105*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512758/5
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 16:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/12/21 16:51*	*1*

Lab Sample ID: LCS 240-512758/4
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.63		ug/L		96	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

Lab Sample ID: 240-159543-G-3 MS
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	9.98		ug/L		100	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

Lab Sample ID: 240-159543-O-3 MSD
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.71		ug/L		97	51 - 153	3	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159618-1

GC/MS VOA

Analysis Batch: 512758

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159618-2	MW-95S_110521	Total/NA	Water	8260B SIM	
MB 240-512758/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512758/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159543-G-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159543-O-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513208

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159618-1	TRIP BLANK_65	Total/NA	Water	8260B	
240-159618-2	MW-95S_110521	Total/NA	Water	8260B	
MB 240-513208/8	Method Blank	Total/NA	Water	8260B	
LCS 240-513208/5	Lab Control Sample	Total/NA	Water	8260B	
240-159636-F-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159636-G-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159618-1

Client Sample ID: TRIP BLANK_65

Lab Sample ID: 240-159618-1

Date Collected: 11/05/21 00:00

Matrix: Water

Date Received: 11/09/21 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513208	11/16/21 15:41	SAM	TAL CAN

Client Sample ID: MW-95S_110521

Lab Sample ID: 240-159618-2

Date Collected: 11/05/21 11:23

Matrix: Water

Date Received: 11/09/21 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513208	11/16/21 19:13	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	512758	11/13/21 02:50	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159618-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

MICHIGAN 190 TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	☐ DW ☐ NPDES ☐ RCRA ☐ Other	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500		Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377		Sampler Name: Andrew Barrett	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client: Lab sampling: Job/SDG No:
Phone: 248-994-2240		Method of Shipment/Carrier:			
Project Name: Ford LTP Off-Site		Shipping/Tracking No:			
Project Number: 30080642.402.04					
PO # 30080642.402.04					

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_05	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-955_110521	11/5/21	1123		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159618 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Arcadis	11/5/21 1500	Novi Cold Storage	Arcadis	11/5/21 1500
	ARCADIS	11/8/21 1200		ETA	11/8/21 1200
	ETA	11/9/21	Received in Laboratory by:	ETA	11-9-21 1000

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 159618
Canton Facility

Client ARCADIS Site Name _____ Cooler unpacked by: Tammy Dayer

Cooler Received on 11-9-21 Opened on 11-9-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 2 Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
   -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? Yes No
11. Sufficient quantity received to perform indicated analyses? ~~Yes No~~ yes 11/11/21
12. Are these work share samples and all listed on the COC? Yes No
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# **HC157842**
14. Were VOAs on the COC? Yes No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 60358 Yes No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page Samples processed by:

TB is not logged for SIM ~~due to insufficient volume.~~
per corrected COC. 11/11/21 ~~11-9-21~~

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

WI-NC-099

Login # : 159618

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form				
Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
(TA) Client Box Other	(IR-14) IR-15	3.6	3.7	(Wet Ice) Blue Ice Dry Ice Water None
(TA) Client Box Other	(IR-14) IR-15	3.7	3.8	(Wet Ice) Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
☐ See Temperature Excursion Form				

WI-NC-099 Cooler Receipt Form Page 2 – Multiple Coolers

DATA VERIFICATION REPORT

November 22, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159618-1
Sample date: 2021-11-05
Report received by CADENA: 2021-11-22
Initial Data Verification completed by CADENA: 2021-11-22
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159618-1

		Sample Name:	TRIP BLANK_65				MW-95S_110521			
		Lab Sample ID:	2401596181				2401596182			
		Sample Date:	11/5/2021				11/5/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

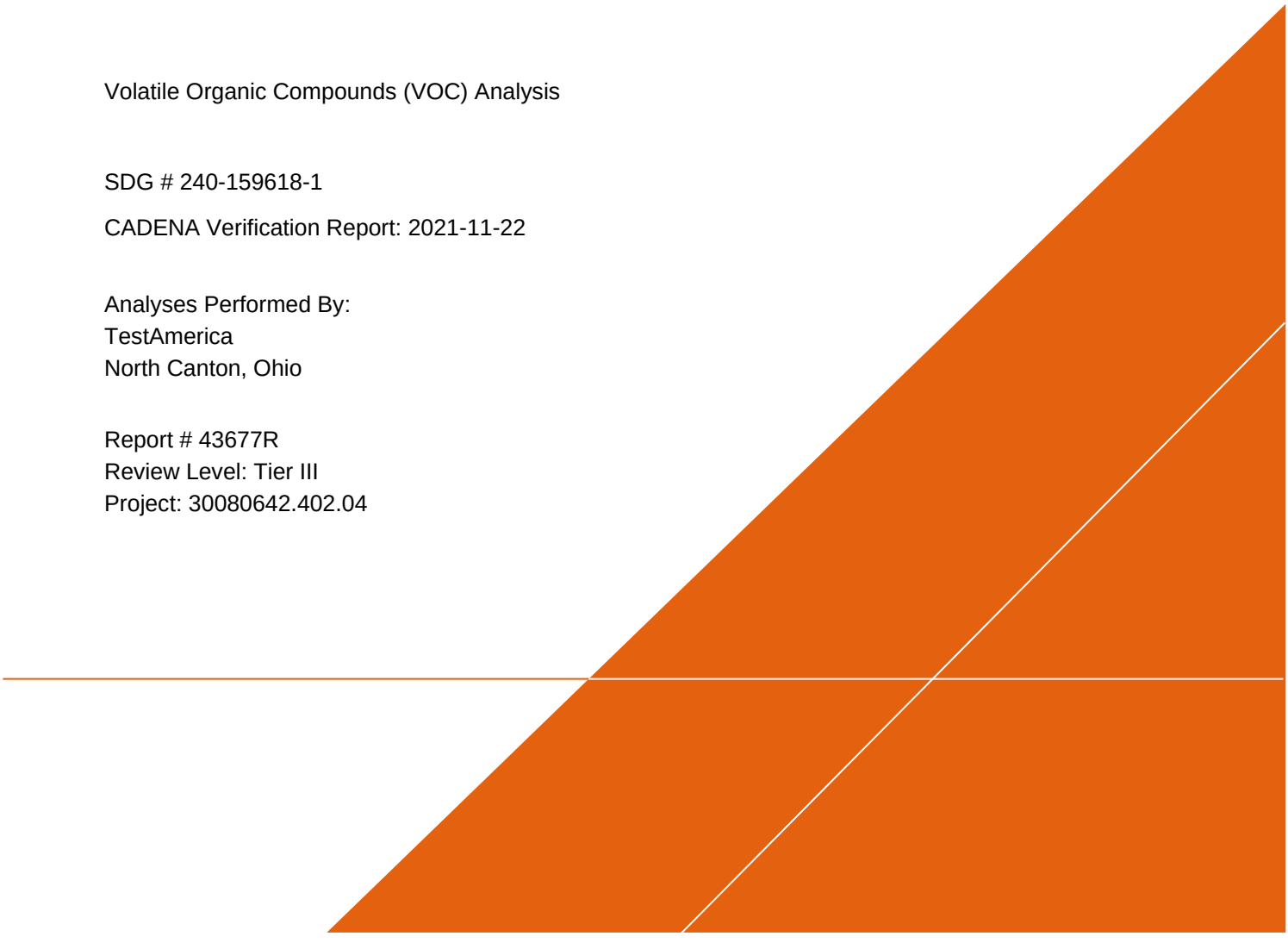
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159618-1

CADENA Verification Report: 2021-11-22

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43677R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159618-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_65	240-159618-1	Water	11/05/21		X	
MW-95S_110521	240-159618-2	Water	11/05/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 10, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 14, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190 TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Andrew Banitt		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30080642.402.04	Shipping/Tracking No:		
PO # 30080642.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below: 10 day ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 65	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-955_ 110521	11/5/21	1123		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159618 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	11/5/21 1500	Novi Cold Storage	Arcadis	11/5/21 1500
[signature]	ARCADIS	11/8/21 / 1200	[signature]	ETA	11/8/21 1200
[signature]	ETA	11/8/21	Received in Laboratory by: [signature]	ETA	11-9-21 1000

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Client Sample ID: TRIP BLANK_65
Lab Sample ID: 240-159618-1
Date Collected: 11/05/21 00:00
Matrix: Water
Date Received: 11/09/21 10:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 15:41	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 15:41	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 15:41	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 15:41	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 15:41	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 15:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*62 - 137*		*11/16/21 15:41*	*1*
4-Bromofluorobenzene (Surr)	*88*		*56 - 136*		*11/16/21 15:41*	*1*
Toluene-d8 (Surr)	*97*		*78 - 122*		*11/16/21 15:41*	*1*
Dibromofluoromethane (Surr)	*108*		*73 - 120*		*11/16/21 15:41*	*1*

Client Sample ID: MW-95S_110521
Lab Sample ID: 240-159618-2
Date Collected: 11/05/21 11:23
Matrix: Water
Date Received: 11/09/21 10:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/13/21 02:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/13/21 02:50*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 19:13	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 19:13	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 19:13	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 19:13	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 19:13	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 19:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*107*		*62 - 137*		*11/16/21 19:13*	*1*
4-Bromofluorobenzene (Surr)	*92*		*56 - 136*		*11/16/21 19:13*	*1*
Toluene-d8 (Surr)	*99*		*78 - 122*		*11/16/21 19:13*	*1*
Dibromofluoromethane (Surr)	*117*		*73 - 120*		*11/16/21 19:13*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-160619-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
12/9/2021 11:47:28 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160619-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-160619-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-160619-1

Comments
No additional comments.

Receipt
The samples were received on 11/23/2021 10:40 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.4° C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) for analytical batch 515372 exceeded control criteria for one or multiple compounds. The samples associated with this CCV were non-detect for the affected analytes. In accordance with the laboratory SOP, a low level CCV at the reporting limit (labeled as an MRL) was analyzed and the affected compounds were detected; therefore the data has been reported. No further corrective action was required: TRIP BLANK_174 (240-160619-1) and MW-207S_111921 (240-160619-2).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160619-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160619-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-160619-1	TRIP BLANK_174	Water	11/19/21 00:00	11/23/21 10:40
240-160619-2	MW-207S_111921	Water	11/19/21 11:53	11/23/21 10:40

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160619-1

Client Sample ID: TRIP BLANK_174 — Lab Sample ID: 240-160619-1

No Detections.

Client Sample ID: MW-207S_111921 — Lab Sample ID: 240-160619-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160619-1

Client Sample ID: TRIP BLANK_174
Date Collected: 11/19/21 00:00
Date Received: 11/23/21 10:40

Lab Sample ID: 240-160619-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			12/02/21 21:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			12/02/21 21:06	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			12/02/21 21:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			12/02/21 21:06	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			12/02/21 21:06	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			12/02/21 21:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*122*		*62 - 137*		*12/02/21 21:06*	*1*
4-Bromofluorobenzene (Surr)	*69*		*56 - 136*		*12/02/21 21:06*	*1*
Toluene-d8 (Surr)	*87*		*78 - 122*		*12/02/21 21:06*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*12/02/21 21:06*	*1*

Client Sample ID: MW-207S_111921
Date Collected: 11/19/21 11:53
Date Received: 11/23/21 10:40

Lab Sample ID: 240-160619-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/25/21 04:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*76*		*66 - 120*		*11/25/21 04:46*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			12/02/21 21:28	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			12/02/21 21:28	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			12/02/21 21:28	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			12/02/21 21:28	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			12/02/21 21:28	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			12/02/21 21:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*122*		*62 - 137*		*12/02/21 21:28*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*12/02/21 21:28*	*1*
Toluene-d8 (Surr)	*87*		*78 - 122*		*12/02/21 21:28*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*12/02/21 21:28*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160619-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-160599-C-1 MS	Matrix Spike	98	102	102	81
240-160599-H-1 MSD	Matrix Spike Duplicate	98	101	101	79
240-160619-1	TRIP BLANK_174	122	69	87	96
240-160619-2	MW-207S_111921	122	70	87	96
LCS 240-515372/4	Lab Control Sample	98	102	102	79
MB 240-515372/7	Method Blank	117	76	91	92

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-160508-G-4 MS	Matrix Spike	75
240-160508-M-4 MSD	Matrix Spike Duplicate	75
240-160619-2	MW-207S_111921	76
LCS 240-514583/4	Lab Control Sample	75
MB 240-514583/5	Method Blank	75

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-515372/7
Matrix: Water
Analysis Batch: 515372

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			12/02/21 13:28	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			12/02/21 13:28	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			12/02/21 13:28	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			12/02/21 13:28	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			12/02/21 13:28	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			12/02/21 13:28	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*62 - 137*		*12/02/21 13:28*	*1*
4-Bromofluorobenzene (Surr)	*76*		*56 - 136*		*12/02/21 13:28*	*1*
Toluene-d8 (Surr)	*91*		*78 - 122*		*12/02/21 13:28*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*12/02/21 13:28*	*1*

Lab Sample ID: LCS 240-515372/4
Matrix: Water
Analysis Batch: 515372

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.55		ug/L		86	63 - 134
cis-1,2-Dichloroethene	10.0	9.74		ug/L		97	77 - 123
Tetrachloroethene	10.0	9.20		ug/L		92	76 - 123
trans-1,2-Dichloroethene	10.0	9.69		ug/L		97	75 - 124
Trichloroethene	10.0	8.31		ug/L		83	70 - 122
Vinyl chloride	10.0	7.65		ug/L		77	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*
4-Bromofluorobenzene (Surr)	*102*		*56 - 136*
Toluene-d8 (Surr)	*102*		*78 - 122*
Dibromofluoromethane (Surr)	*79*		*73 - 120*

Lab Sample ID: 240-160599-C-1 MS
Matrix: Water
Analysis Batch: 515372

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	8.09		ug/L		81	56 - 135
cis-1,2-Dichloroethene	1.5		10.0	10.5		ug/L		91	66 - 128
Tetrachloroethene	1.0	U	10.0	8.68		ug/L		87	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.65		ug/L		96	56 - 136
Trichloroethene	1.0	U	10.0	8.23		ug/L		82	61 - 124
Vinyl chloride	0.64	J	10.0	7.39		ug/L		67	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*
4-Bromofluorobenzene (Surr)	*102*		*56 - 136*
Toluene-d8 (Surr)	*102*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-160599-C-1 MS
Matrix: Water
Analysis Batch: 515372

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*81*		*73 - 120*

Lab Sample ID: 240-160599-H-1 MSD
Matrix: Water
Analysis Batch: 515372

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	8.17		ug/L		82	56 - 135	1	26
cis-1,2-Dichloroethene	1.5		10.0	10.7		ug/L		92	66 - 128	1	14
Tetrachloroethene	1.0	U	10.0	8.78		ug/L		88	62 - 131	1	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.65		ug/L		97	56 - 136	0	15
Trichloroethene	1.0	U	10.0	8.32		ug/L		83	61 - 124	1	15
Vinyl chloride	0.64	J	10.0	7.33		ug/L		67	43 - 157	1	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*
4-Bromofluorobenzene (Surr)	*101*		*56 - 136*
Toluene-d8 (Surr)	*101*		*78 - 122*
Dibromofluoromethane (Surr)	*79*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-514583/5
Matrix: Water
Analysis Batch: 514583

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/24/21 20:04	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*		*11/24/21 20:04*	*1*

Lab Sample ID: LCS 240-514583/4
Matrix: Water
Analysis Batch: 514583

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.2		ug/L		102	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*

Lab Sample ID: 240-160508-G-4 MS
Matrix: Water
Analysis Batch: 514583

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	1.0	J F1	10.0	11.9		ug/L		109	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*

Lab Sample ID: 240-160508-M-4 MSD
Matrix: Water
Analysis Batch: 514583

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	1.0	J F1	10.0	10.5		ug/L		95	51 - 153	13	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*

GC/MS VOA

Analysis Batch: 514583

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-160619-2	MW-207S_111921	Total/NA	Water	8260B SIM	
MB 240-514583/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-514583/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-160508-G-4 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-160508-M-4 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 515372

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-160619-1	TRIP BLANK_174	Total/NA	Water	8260B	
240-160619-2	MW-207S_111921	Total/NA	Water	8260B	
MB 240-515372/7	Method Blank	Total/NA	Water	8260B	
LCS 240-515372/4	Lab Control Sample	Total/NA	Water	8260B	
240-160599-C-1 MS	Matrix Spike	Total/NA	Water	8260B	
240-160599-H-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160619-1

Client Sample ID: TRIP BLANK_174

Lab Sample ID: 240-160619-1

Date Collected: 11/19/21 00:00

Matrix: Water

Date Received: 11/23/21 10:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	515372	12/02/21 21:06	LEE	TAL CAN

Client Sample ID: MW-207S_111921

Lab Sample ID: 240-160619-2

Date Collected: 11/19/21 11:53

Matrix: Water

Date Received: 11/23/21 10:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	515372	12/02/21 21:28	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	514583	11/25/21 04:46	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160619-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190 1-3|1-4

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	DW / NPDES / RCRA / Other	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500		Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377		Sampler Name: Sam Hindle / COURIER: CHRISTIAN WEAVER	TAT if different from below: 10 day / 3 weeks / 2 weeks / 1 week / 2 days / 1 day		Walk-in client
Phone: 248-994-2240		Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site		Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04					
PO # 30080642.402.04					

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_174	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-2075-111921	11/19/21	11:53		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-160619 Chain of Custody

Possible Hazard Identification: Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / Disposal By Lab / Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[illegible]	Arcadis	11/19/21 15:20	Novi cold storage	Arcadis	11/19/21 15:20
[illegible]	ARCADIS	11/22/21	[illegible]	ETA	11/22/21
[illegible]	ETA	11/22/21	Received in Laboratory by: [illegible]	ETA	11/23/21 10:40

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12/9/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 160619**
Canton Facility

Client Arcadis Site Name

Cooler Received on 11/23/21 Opened on 11/23/21

Cooler unpacked by: Matthew Swma

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # 1A Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 1.3 °C Corrected Cooler Temp. 1.4 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC157842
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 0226201F	Yes	No
17. Was a LL Hg or Me Hg trip blank present?	Yes	No

JME 11/23/21

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

No STM on TB per corrected COC. JME 11/23/21

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container.
Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.
Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

WI-NC-099

DATA VERIFICATION REPORT

December 09, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 160619-1
Sample date: 2021-11-19
Report received by CADENA: 2021-12-09
Initial Data Verification completed by CADENA: 2021-12-09
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 160619-1

		Sample Name:	TRIP BLANK_174				MW-207S_111921			
		Lab Sample ID:	2401606191				2401606192			
		Sample Date:	11/19/2021				11/19/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

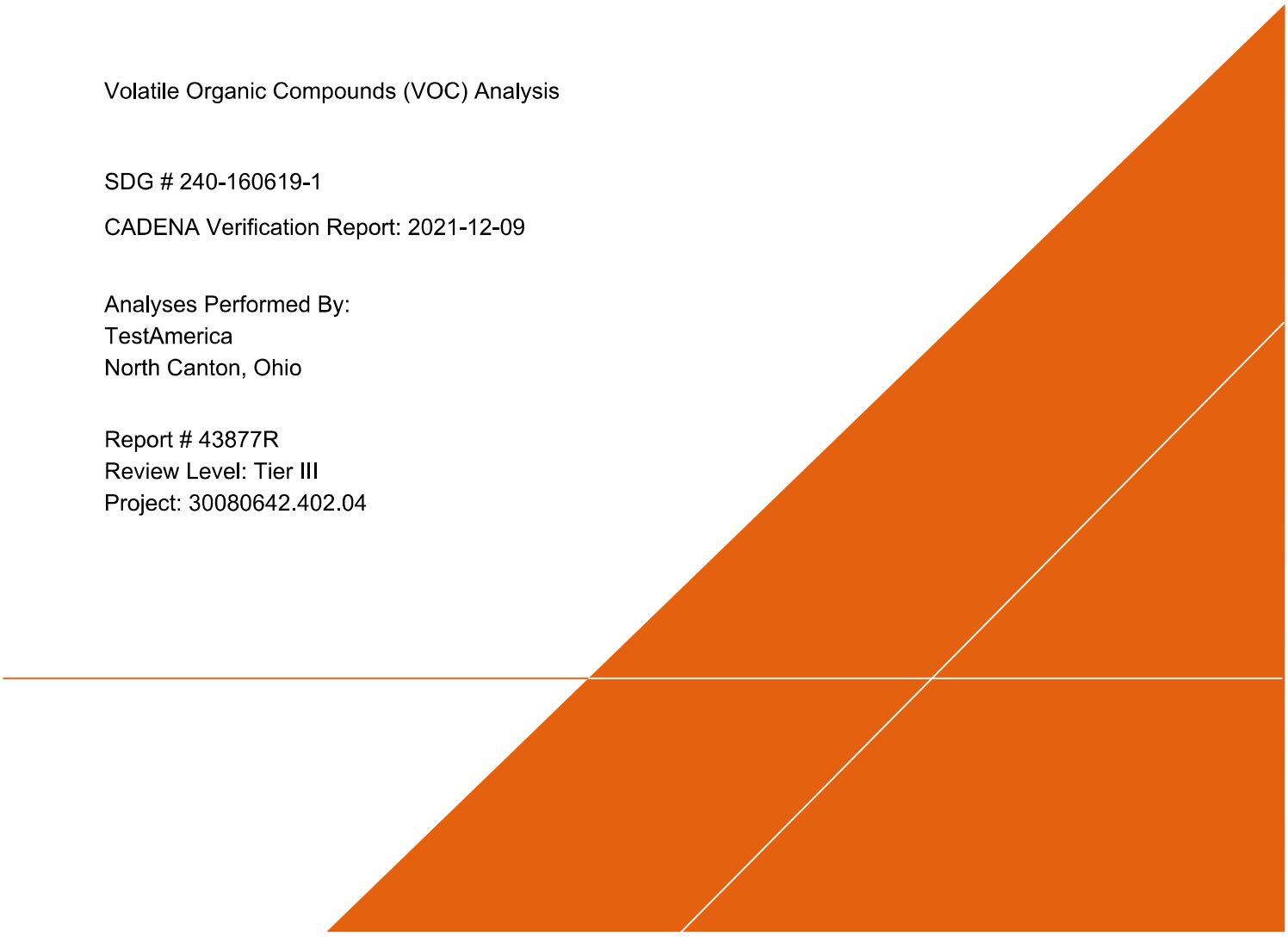
Volatile Organic Compounds (VOC) Analysis

SDG # 240-160619-1

CADENA Verification Report: 2021-12-09

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43877R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-160619-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_174	240-160619-1	Water	11/19/21		X	
MW-207S_111921	240-160619-2	Water	11/19/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Compound	Criteria
TRIP BLANK_174 MW-207S_111921	Continuous Calibration Verification %D	Vinyl chloride	-23.6%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	

Initial/Continuing	Criteria	Sample Result	Qualification
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 20, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 20, 2021

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190 13/1-4

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	DW / NPDES / RCRA / Other	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500		Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377		Sampler Name: Sam Hindle / COURIER: CHRISTINE WEAVER	TAT if different from below		Walk-in client
Phone: 248-994-2240		Method of Shipment/Carrier:	10 day / 3 weeks / 2 weeks / 1 week / 2 days / 1 day		Lab sampling
Project Name: Ford LTP Off-Site		Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04					
PO # 30080642.402.04					

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_174	—	—		X						1					N	G	X	X	X	X	X	X	X (3)	1 Trip Blank
MW-2075-111921	11/19/21	11:53		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-160619 Chain of Custody

Possible Hazard Identification: Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / Disposal By Lab / Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Arcadis	11/19/21 15:20	Novi cold storage	Arcadis	11/19/21 15:20
	ARCADIS	11/22/21 /		ETA	11/22/21 /
	ETA	11/22/21		ETA	11/23/21 10:40

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Client Sample ID: TRIP BLANK_174 — Lab Sample ID: 240-160619-1

Date Collected: 11/19/21 00:00 — **Matrix: Water**
Date Received: 11/23/21 10:40

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			12/02/21 21:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			12/02/21 21:06	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			12/02/21 21:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			12/02/21 21:06	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			12/02/21 21:06	1
Vinyl chloride	1.0	~~U~~ UJ	1.0	0.45	ug/L			12/02/21 21:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*122*		*62 - 137*		*12/02/21 21:06*	*1*
4-Bromofluorobenzene (Surr)	*69*		*56 - 136*		*12/02/21 21:06*	*1*
Toluene-d8 (Surr)	*87*		*78 - 122*		*12/02/21 21:06*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*12/02/21 21:06*	*1*

Client Sample ID: MW-207S_111921 — Lab Sample ID: 240-160619-2

Date Collected: 11/19/21 11:53 — **Matrix: Water**
Date Received: 11/23/21 10:40

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/25/21 04:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*76*		*66 - 120*		*11/25/21 04:46*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			12/02/21 21:28	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			12/02/21 21:28	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			12/02/21 21:28	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			12/02/21 21:28	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			12/02/21 21:28	1
Vinyl chloride	1.0	~~U~~ UJ	1.0	0.45	ug/L			12/02/21 21:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*122*		*62 - 137*		*12/02/21 21:28*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*12/02/21 21:28*	*1*
Toluene-d8 (Surr)	*87*		*78 - 122*		*12/02/21 21:28*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*12/02/21 21:28*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159823-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/26/2021 7:47:44 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159823-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159823-1

Job ID: 240-159823-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159823-1

Comments
No additional comments.

Receipt
The samples were received on 11/11/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 4.6º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159823-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159823-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159823-1	TRIP BLANK_97	Water	11/09/21 00:00	11/11/21 08:00
240-159823-2	MW-171S_110921	Water	11/09/21 09:13	11/11/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159823-1

Client Sample ID: TRIP BLANK_97 — Lab Sample ID: 240-159823-1

No Detections.

Client Sample ID: MW-171S_110921 — Lab Sample ID: 240-159823-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159823-1

Client Sample ID: TRIP BLANK_97

Date Collected: 11/09/21 00:00
Date Received: 11/11/21 08:00

Lab Sample ID: 240-159823-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 04:34	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 04:34	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 04:34	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 04:34	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 04:34	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 04:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*113*		*62 - 137*		*11/19/21 04:34*	*1*
4-Bromofluorobenzene (Surr)	*79*		*56 - 136*		*11/19/21 04:34*	*1*
Toluene-d8 (Surr)	*110*		*78 - 122*		*11/19/21 04:34*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/19/21 04:34*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159823-1

Client Sample ID: MW-171S_110921
Date Collected: 11/09/21 09:13
Date Received: 11/11/21 08:00

Lab Sample ID: 240-159823-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 21:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*		*11/12/21 21:01*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 04:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 04:57	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 04:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 04:57	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 04:57	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 04:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*62 - 137*		*11/19/21 04:57*	*1*
4-Bromofluorobenzene (Surr)	*86*		*56 - 136*		*11/19/21 04:57*	*1*
Toluene-d8 (Surr)	*103*		*78 - 122*		*11/19/21 04:57*	*1*
Dibromofluoromethane (Surr)	*105*		*73 - 120*		*11/19/21 04:57*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159823-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159823-1	TRIP BLANK_97	113	79	110	102
240-159823-2	MW-171S_110921	117	86	103	105
240-159830-D-2 MS	Matrix Spike	110	86	101	96
240-159830-E-2 MSD	Matrix Spike Duplicate	107	84	97	94
LCS 240-513667/4	Lab Control Sample	101	85	107	94
MB 240-513667/6	Method Blank	110	81	108	98

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159541-G-2 MS	Matrix Spike	77
240-159541-M-2 MSD	Matrix Spike Duplicate	78
240-159823-2	MW-171S_110921	78
LCS 240-512785/4	Lab Control Sample	79
MB 240-512785/5	Method Blank	79

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513667/6
Matrix: Water
Analysis Batch: 513667

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 23:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 23:24	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 23:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 23:24	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 23:24	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 23:24	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*62 - 137*		*11/18/21 23:24*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/18/21 23:24*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/18/21 23:24*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/18/21 23:24*	*1*

Lab Sample ID: LCS 240-513667/4
Matrix: Water
Analysis Batch: 513667

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.6		ug/L		106	63 - 134
cis-1,2-Dichloroethene	10.0	10.7		ug/L		107	77 - 123
Tetrachloroethene	10.0	12.0		ug/L		120	76 - 123
trans-1,2-Dichloroethene	10.0	10.6		ug/L		106	75 - 124
Trichloroethene	10.0	9.72		ug/L		97	70 - 122
Vinyl chloride	10.0	7.48		ug/L		75	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*101*		*62 - 137*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*
Toluene-d8 (Surr)	*107*		*78 - 122*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: 240-159830-D-2 MS
Matrix: Water
Analysis Batch: 513667

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	8.06		ug/L		81	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.32		ug/L		93	66 - 128
Tetrachloroethene	1.0	U	10.0	9.01		ug/L		90	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.50		ug/L		95	56 - 136
Trichloroethene	1.0	U	10.0	8.17		ug/L		82	61 - 124
Vinyl chloride	1.0	U	10.0	7.02		ug/L		70	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*110*		*62 - 137*
4-Bromofluorobenzene (Surr)	*86*		*56 - 136*
Toluene-d8 (Surr)	*101*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159830-D-2 MS
Matrix: Water
Analysis Batch: 513667

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*96*		*73 - 120*

Lab Sample ID: 240-159830-E-2 MSD
Matrix: Water
Analysis Batch: 513667

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	7.67		ug/L		77	56 - 135	5	26
cis-1,2-Dichloroethene	1.0	U	10.0	8.48		ug/L		85	66 - 128	9	14
Tetrachloroethene	1.0	U	10.0	8.29		ug/L		83	62 - 131	8	20
trans-1,2-Dichloroethene	1.0	U	10.0	8.31		ug/L		83	56 - 136	13	15
Trichloroethene	1.0	U	10.0	7.56		ug/L		76	61 - 124	8	15
Vinyl chloride	1.0	U	10.0	6.48		ug/L		65	43 - 157	8	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*107*		*62 - 137*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*
Toluene-d8 (Surr)	*97*		*78 - 122*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512785/5
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 18:32	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*66 - 120*		*11/12/21 18:32*	*1*

Lab Sample ID: LCS 240-512785/4
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.7		ug/L		107	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*66 - 120*

Lab Sample ID: 240-159541-G-2 MS
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

Lab Sample ID: 240-159541-M-2 MSD
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.4		ug/L		104	51 - 153	2	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159823-1

GC/MS VOA

Analysis Batch: 512785

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159823-2	MW-171S_110921	Total/NA	Water	8260B SIM	
MB 240-512785/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512785/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159541-G-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159541-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513667

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159823-1	TRIP BLANK_97	Total/NA	Water	8260B	
240-159823-2	MW-171S_110921	Total/NA	Water	8260B	
MB 240-513667/6	Method Blank	Total/NA	Water	8260B	
LCS 240-513667/4	Lab Control Sample	Total/NA	Water	8260B	
240-159830-D-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159830-E-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159823-1

Client Sample ID: TRIP BLANK_97

Lab Sample ID: 240-159823-1

Date Collected: 11/09/21 00:00

Matrix: Water

Date Received: 11/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513667	11/19/21 04:34	LEE	TAL CAN

Client Sample ID: MW-171S_110921

Lab Sample ID: 240-159823-2

Date Collected: 11/09/21 09:13

Matrix: Water

Date Received: 11/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513667	11/19/21 04:57	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512785	11/12/21 21:01	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159823-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	For lab use only
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		Walk-in client
Phone: 248-994-2240	Sampler Name: Sommer Guy	TAT if different from below: 10 day; 3 weeks / 2 weeks / 1 week / 2 days / 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30080642.402.04	Shipping/Tracking No:			
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_97	—	—		X						1							X	X	X	X	X	X	X	1 Trip Blank
MW-171S-110921	11/9/21	9:13		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159823 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Sommer Guy	Arcadis	11/9/21 15:00	Novi Cold Storage	Arcadis	11/9/21 15:00
	Arcadis	11/10/21		GTA	11/9/21 1036
	GTA	11/10/21 1045	Received in Laboratory by:	ETA	11-11-21 900

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11/26/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159823**
Canton Facility

Client Arcadis Site Name

Cooler Received on 11-11-21 Opened on 11-11-21

Cooler unpacked by: Tammy Depp

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # 1A Foam Box Client Cooler Box Other

Packing material used: ~~Bubble Wrap~~ Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 4.5 °C Corrected Cooler Temp. 4.6 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# **HC157842**
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 60358 (Yes) No
17. Was a LL Hg or Me Hg trip blank present? ____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

no SIM on TB per corrected COC. DMP 11/11/21

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

November 26, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159823-1
Sample date: 2021-11-09
Report received by CADENA: 2021-11-26
Initial Data Verification completed by CADENA: 2021-11-26
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159823-1

		Sample Name:	TRIP BLANK_97				MW-171S_110921			
		Lab Sample ID:	2401598231				2401598232			
		Sample Date:	11/9/2021				11/9/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

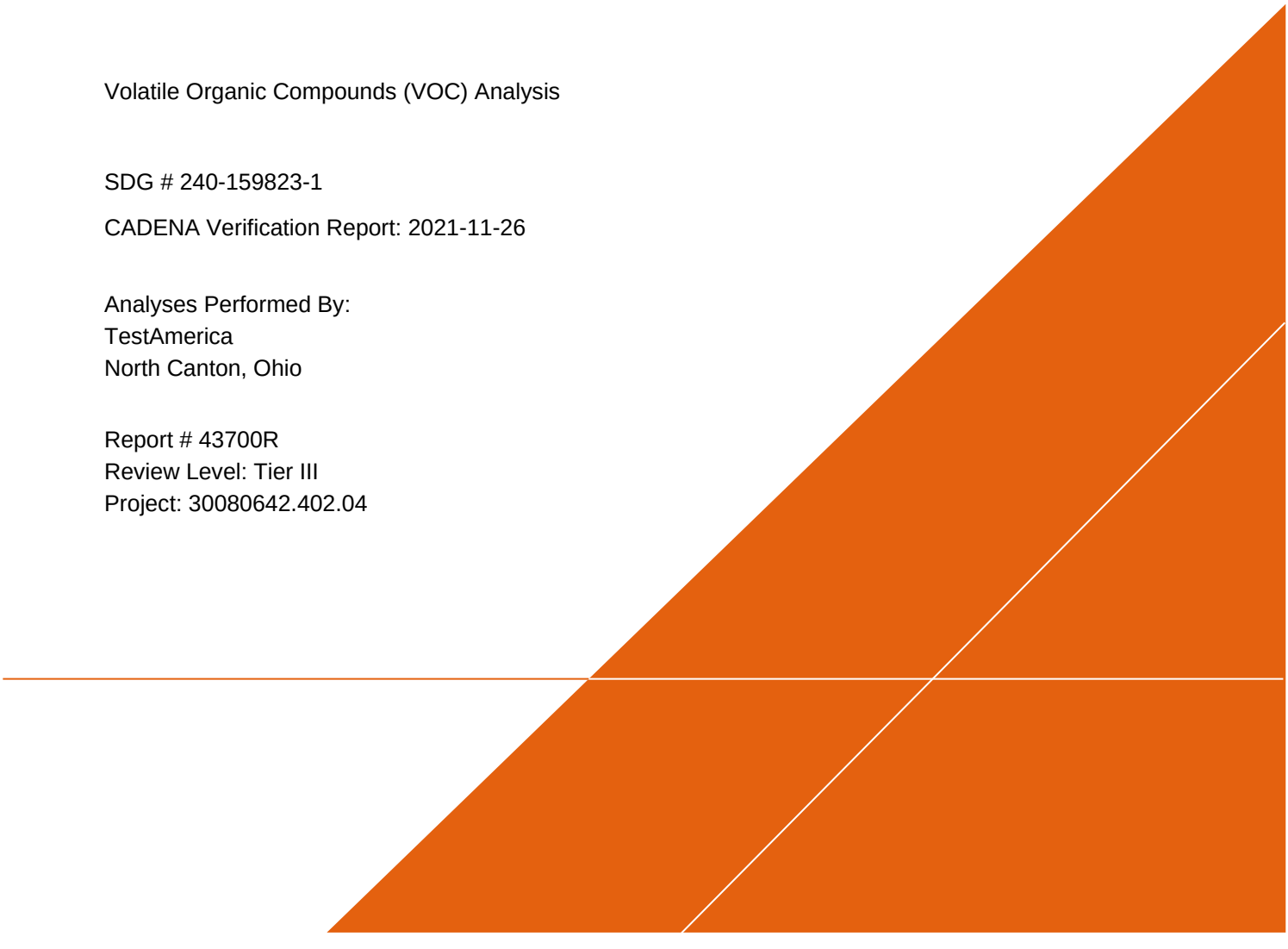
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159823-1

CADENA Verification Report: 2021-11-26

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43700R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159823-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_97	240-159823-1	Water	11/09/21		X	
MW-171S_110921	240-159823-2	Water	11/09/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 13, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Sommer Guy	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_97	—	—		X						1							X	X	X	X	X	X		1 Trip Blank
MW-1715-110921	11/9/21	9:13		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159823 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Sommer Guy	Arcadis	11/9/21 15:00	Novi Cold Storage	Arcadis	11/9/21 15:00
	Arcadis	11/10/21		GFS	11/9/21 1036
	GFS	11/10/21 1045	Received in Laboratory by:	ETA	11-11-21 900

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11/26/2021

Client Sample ID: TRIP BLANK_97
Lab Sample ID: 240-159823-1
Date Collected: 11/09/21 00:00
Matrix: Water
Date Received: 11/11/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 04:34	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 04:34	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 04:34	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 04:34	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 04:34	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 04:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*113*		*62 - 137*		*11/19/21 04:34*	*1*
4-Bromofluorobenzene (Surr)	*79*		*56 - 136*		*11/19/21 04:34*	*1*
Toluene-d8 (Surr)	*110*		*78 - 122*		*11/19/21 04:34*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/19/21 04:34*	*1*

Client Sample ID: MW-171S_110921
Lab Sample ID: 240-159823-2
Date Collected: 11/09/21 09:13
Matrix: Water
Date Received: 11/11/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 21:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*		*11/12/21 21:01*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 04:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 04:57	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 04:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 04:57	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 04:57	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 04:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*62 - 137*		*11/19/21 04:57*	*1*
4-Bromofluorobenzene (Surr)	*86*		*56 - 136*		*11/19/21 04:57*	*1*
Toluene-d8 (Surr)	*103*		*78 - 122*		*11/19/21 04:57*	*1*
Dibromofluoromethane (Surr)	*105*		*73 - 120*		*11/19/21 04:57*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159713-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/24/2021 8:23:58 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159713-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
E	Result exceeded calibration range.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159713-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159713-1

Comments
No additional comments.

Receipt
The samples were received on 11/10/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 0.7° C and 0.8° C.

GC/MS VOA
Method 8260B: The MSD for batch 513414 is outside of QC tune time but is reported: (240-159610-C-1 MSD).

Method 8260B: The laboratory control sample (LCS) for 513414 recovered outside control limits for multiple analytes. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159713-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159713-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159713-1	TRIP BLANK_48	Water	11/05/21 00:00	11/10/21 08:00
240-159713-2	MW-118S_110521	Water	11/05/21 14:31	11/10/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159713-1

Client Sample ID: TRIP BLANK_48 — Lab Sample ID: 240-159713-1

No Detections.

Client Sample ID: MW-118S_110521 — Lab Sample ID: 240-159713-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159713-1

Client Sample ID: TRIP BLANK_48
Date Collected: 11/05/21 00:00
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159713-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 16:39	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 16:39	1
Tetrachloroethene	1.0	U *+	1.0	0.44	ug/L			11/17/21 16:39	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 16:39	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 16:39	1
Vinyl chloride	1.0	U *+	1.0	0.45	ug/L			11/17/21 16:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*62 - 137*		*11/17/21 16:39*	*1*
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*11/17/21 16:39*	*1*
Toluene-d8 (Surr)	*102*		*78 - 122*		*11/17/21 16:39*	*1*
Dibromofluoromethane (Surr)	*90*		*73 - 120*		*11/17/21 16:39*	*1*

Client Sample ID: MW-118S_110521

Date Collected: 11/05/21 14:31
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159713-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 01:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*76*		*66 - 120*		*11/18/21 01:33*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 17:01	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 17:01	1
Tetrachloroethene	1.0	U *+	1.0	0.44	ug/L			11/17/21 17:01	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 17:01	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 17:01	1
Vinyl chloride	1.0	U *+	1.0	0.45	ug/L			11/17/21 17:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*62 - 137*		*11/17/21 17:01*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/17/21 17:01*	*1*
Toluene-d8 (Surr)	*105*		*78 - 122*		*11/17/21 17:01*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*11/17/21 17:01*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159713-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159610-C-1 MS	Matrix Spike	100	90	114	97
240-159610-C-1 MSD	Matrix Spike Duplicate	96	86	108	92
240-159713-1	TRIP BLANK_48	91	73	102	90
240-159713-2	MW-118S_110521	97	82	105	95
LCS 240-513414/4	Lab Control Sample	98	93	119	99
MB 240-513414/6	Method Blank	92	75	103	91

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159636-H-2 MS	Matrix Spike	77
240-159636-N-2 MSD	Matrix Spike Duplicate	77
240-159713-2	MW-118S_110521	76
LCS 240-513479/4	Lab Control Sample	78
MB 240-513479/5	Method Blank	77

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513414/6
Matrix: Water
Analysis Batch: 513414

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 13:40	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 13:40	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 13:40	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 13:40	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 13:40	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 13:40	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/17/21 13:40*	*1*
4-Bromofluorobenzene (Surr)	*75*		*56 - 136*		*11/17/21 13:40*	*1*
Toluene-d8 (Surr)	*103*		*78 - 122*		*11/17/21 13:40*	*1*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*11/17/21 13:40*	*1*

Lab Sample ID: LCS 240-513414/4
Matrix: Water
Analysis Batch: 513414

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	12.1		ug/L		121	63 - 134
cis-1,2-Dichloroethene	10.0	11.7		ug/L		117	77 - 123
Tetrachloroethene	10.0	13.3	*+	ug/L		133	76 - 123
trans-1,2-Dichloroethene	10.0	11.9		ug/L		119	75 - 124
Trichloroethene	10.0	10.3		ug/L		103	70 - 122
Vinyl chloride	10.0	14.5	*+	ug/L		145	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*
4-Bromofluorobenzene (Surr)	*93*		*56 - 136*
Toluene-d8 (Surr)	*119*		*78 - 122*
Dibromofluoromethane (Surr)	*99*		*73 - 120*

Lab Sample ID: 240-159610-C-1 MS
Matrix: Water
Analysis Batch: 513414

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	6400		3330	9810		ug/L		103	56 - 135
cis-1,2-Dichloroethene	6900		3330	10800		ug/L		115	66 - 128
Tetrachloroethene	16000	E *+	3330	18200	E 4	ug/L		55	62 - 131
trans-1,2-Dichloroethene	330	U	3330	3900		ug/L		117	56 - 136
Trichloroethene	2600		3330	5610		ug/L		92	61 - 124
Vinyl chloride	190	J *+	3330	5040		ug/L		146	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*90*		*56 - 136*
Toluene-d8 (Surr)	*114*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159610-C-1 MS
Matrix: Water
Analysis Batch: 513414

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*97*		*73 - 120*

Lab Sample ID: 240-159610-C-1 MSD
Matrix: Water
Analysis Batch: 513414

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	6400		3330	8970		ug/L		78	56 - 135	9	26
cis-1,2-Dichloroethene	6900		3330	9820		ug/L		87	66 - 128	9	14
Tetrachloroethene	16000	E *+	3330	16800	E 4	ug/L		13	62 - 131	8	20
trans-1,2-Dichloroethene	330	U	3330	3420		ug/L		103	56 - 136	13	15
Trichloroethene	2600		3330	5290		ug/L		82	61 - 124	6	15
Vinyl chloride	190	J *+	3330	4530		ug/L		130	43 - 157	11	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*
4-Bromofluorobenzene (Surr)	*86*		*56 - 136*
Toluene-d8 (Surr)	*108*		*78 - 122*
Dibromofluoromethane (Surr)	*92*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513479/5
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 17:41	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*		*11/17/21 17:41*	*1*

Lab Sample ID: LCS 240-513479/4
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	11.9		ug/L		119	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*

Lab Sample ID: 240-159636-H-2 MS
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

Lab Sample ID: 240-159636-N-2 MSD
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153	0	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159713-1

GC/MS VOA

Analysis Batch: 513414

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159713-1	TRIP BLANK_48	Total/NA	Water	8260B	
240-159713-2	MW-118S_110521	Total/NA	Water	8260B	
MB 240-513414/6	Method Blank	Total/NA	Water	8260B	
LCS 240-513414/4	Lab Control Sample	Total/NA	Water	8260B	
240-159610-C-1 MS	Matrix Spike	Total/NA	Water	8260B	
240-159610-C-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 513479

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159713-2	MW-118S_110521	Total/NA	Water	8260B SIM	
MB 240-513479/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513479/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159636-H-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159636-N-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159713-1

Client Sample ID: TRIP BLANK_48

Lab Sample ID: 240-159713-1

Date Collected: 11/05/21 00:00

Matrix: Water

Date Received: 11/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513414	11/17/21 16:39	LEE	TAL CAN

Client Sample ID: MW-118S_110521

Lab Sample ID: 240-159713-2

Date Collected: 11/05/21 14:31

Matrix: Water

Date Received: 11/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513414	11/17/21 17:01	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513479	11/18/21 01:33	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159713-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	For lab use only
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		Walk-in client
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:	10 day		Job/SDG No:
Project Number: 30080642.402.04	Shipping/Tracking No:			
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_48	---	---		X						1					N	G	X	X	X	X	X	X	* (SW)	1 Trip Blank
MW-1185-110521	11/05/21	14:31		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159713 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ an Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	11/08/21 1623	Novi Cold storage	Arcadis	11/08/21 1623
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	ARCADIS	11/9/21 1040	Jeri Hall	ETA	11/9/21 1040
Relinquished by: Jeri Hall	Company: ETA	Date/Time: 11/9/21 1055	Received in Laboratory by: Marvelyn Block	Company: CPA	Date/Time: 11-10-21 8:00

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11/24/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 159413

Client Arcadis Site Name

Cooler unpacked by: Marilyn Bleau

Cooler Received on 11-10-21 Opened on 11-10-21

FedEx: 1st Grd Exp UPS FAS Courier Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: ~~Bubble Wrap~~ Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity_____	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC157842
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #_____	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

No SIM on TB per Corrected COC. SMP 11-10-21

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

Login # : 159713

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form			
Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
(IR) Client Box Other	(IR-14) IR-15	0-6	0-7	(Wet Ice) Blue Ice Dry Ice Water None
(TA) Client Box Other	(IR-14) IR-15	0-7	0-8	(Wet Ice) Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice

DATA VERIFICATION REPORT

November 25, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159713-1
Sample date: 2021-11-05
Report received by CADENA: 2021-11-24
Initial Data Verification completed by CADENA: 2021-11-25
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

MS/MSD recovery outliers or sample duplicate RPD outliers were not determined using a client sample from this submittal for the test and QC batch noted so qualification was not required based on these sample-specific QC outliers: GCMS VOC QC batch 513414.

LCS recoveries were outliers biased HIGH for these tests and analytes (or one LCS and the associated LCS/LCSD RPD). All associated client sample results were non-detect for these analytes so were not affected by the high bias and qualification was not required: GCMS VOC QC batch 51314 - tetrachloroethylene, vinyl chloride.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159713-1

		Sample Name:	TRIP BLANK_48				MW-118S_110521			
		Lab Sample ID:	2401597131				2401597132			
		Sample Date:	11/5/2021				11/5/2021			
Analyte		Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC										
	OSW-8260B									
	1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	OSW-8260BBSim									
	1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

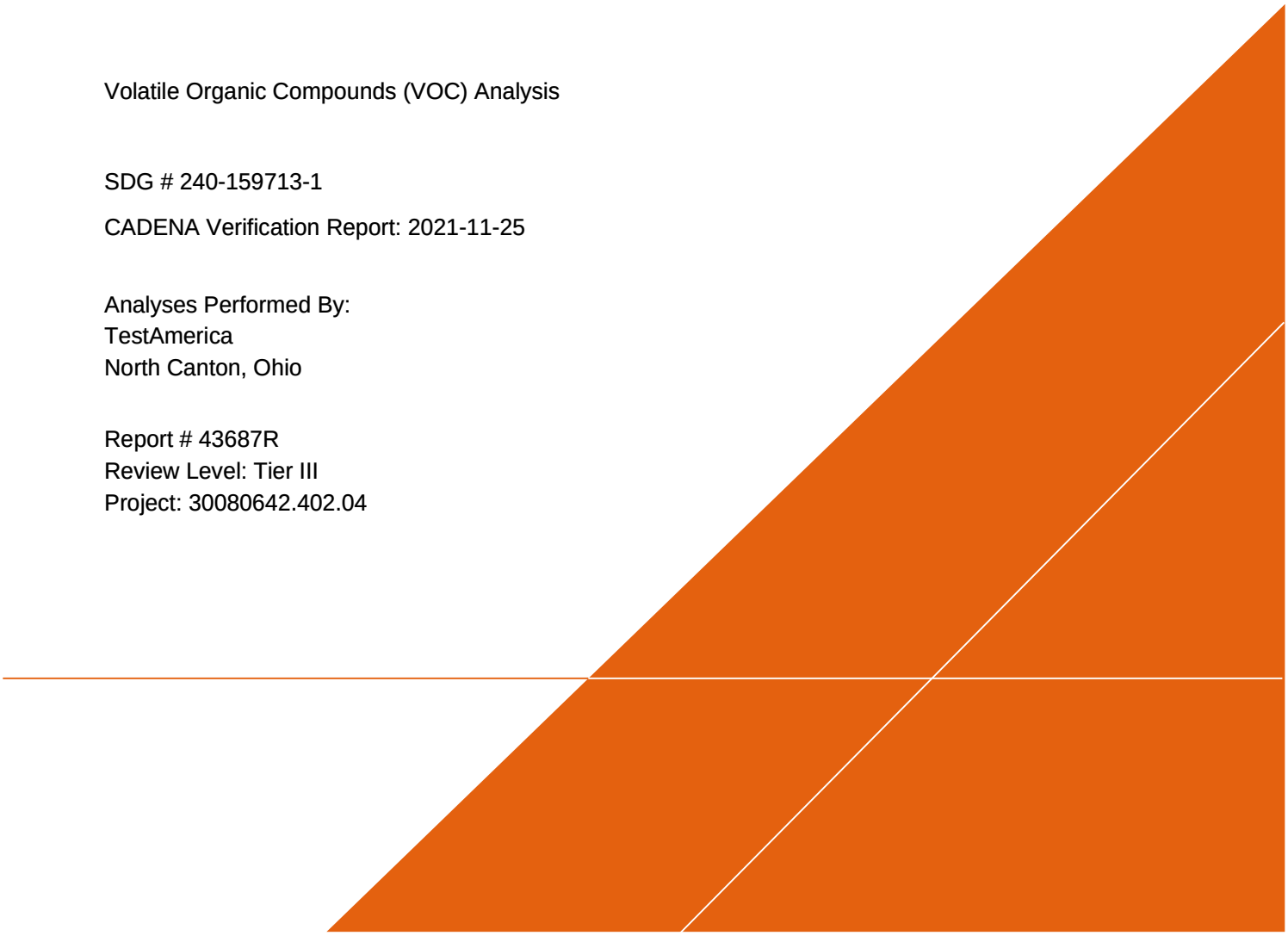
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159713-1

CADENA Verification Report: 2021-11-25

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43687R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159713-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_48	240-159713-1	Water	11/05/21		X	
MW-118S_110521	240-159713-2	Water	11/05/21		X	X

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 10, 2021

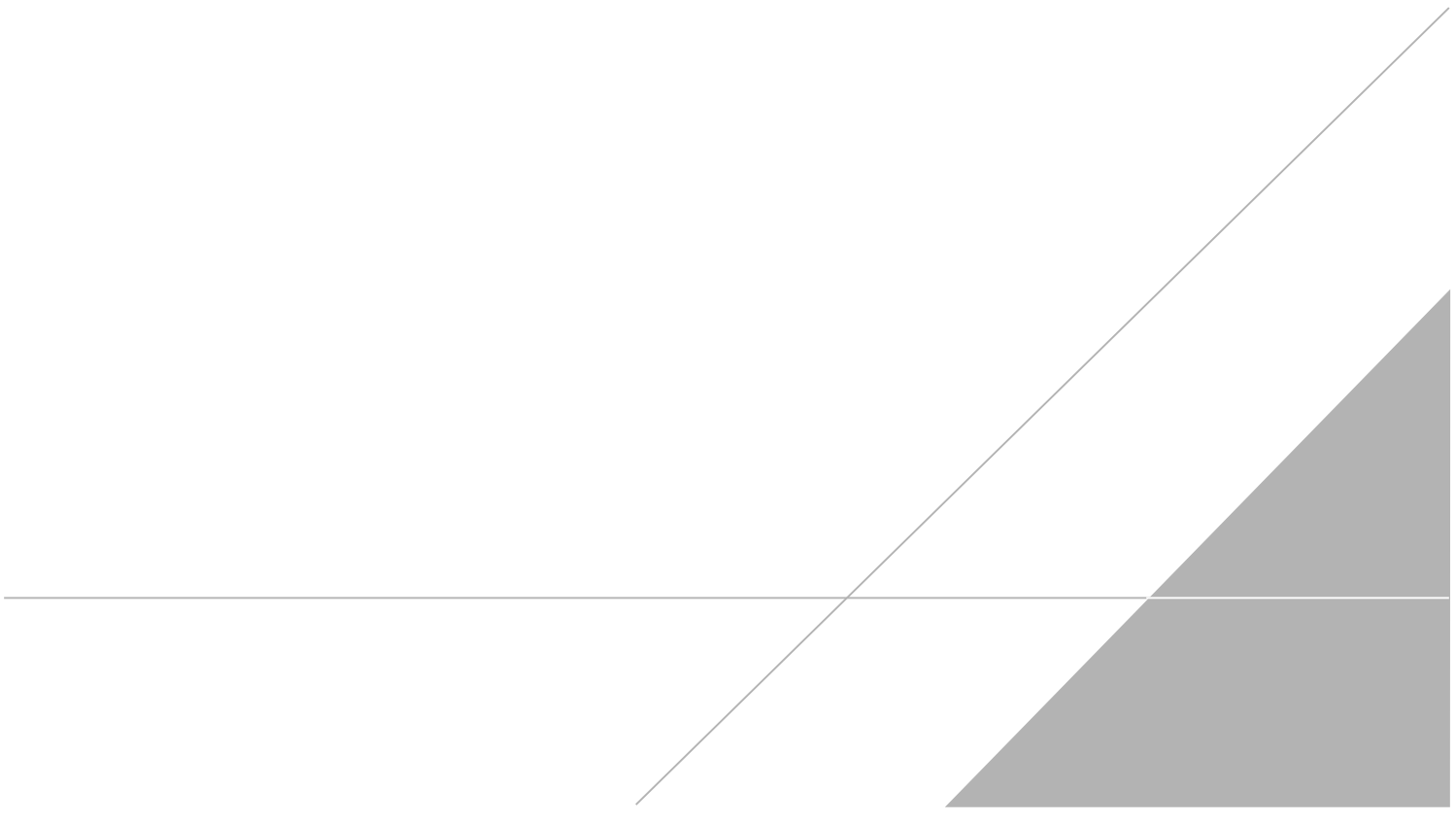
PEER REVIEW: Andrew Korycinski

DATE: December 14, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	☐ DW ☐ NPDES ☐ RCRA ☐ Other	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500		Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377		Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client:
Phone: 248-994-2240		Method of Shipment/Carrier:	10 day		Lab sampling:
Project Name: Ford LTP Off-Site		Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04					
PO # 30080642.402.04					

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_48	---	---		X						1					N	G	X	X	X	X	X	X	* (EW)	1 Trip Blank
MW-1185-110521	11/05/21	14:31		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159713 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	11/08/21 1623	Novi Cold storage	Arcadis	11/08/21 1623
[signature]	ARCADIS	11/9/21 1040	[signature]	ETA	11/9/21 1040
[signature]	ETA	11/9/21 1055	Mandolyn Black	CTD	11-10-21 8:00

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11/24/2021

Client Sample ID: TRIP BLANK_48 — Lab Sample ID: 240-159713-1

Date Collected: 11/05/21 00:00 — **Matrix: Water**
Date Received: 11/10/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 16:39	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 16:39	1
Tetrachloroethene	1.0	U *+	1.0	0.44	ug/L			11/17/21 16:39	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 16:39	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 16:39	1
Vinyl chloride	1.0	U *+	1.0	0.45	ug/L			11/17/21 16:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*62 - 137*		*11/17/21 16:39*	
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*11/17/21 16:39*	
Toluene-d8 (Surr)	*102*		*78 - 122*		*11/17/21 16:39*	
Dibromofluoromethane (Surr)	*90*		*73 - 120*		*11/17/21 16:39*	

Client Sample ID: MW-118S_110521 — Lab Sample ID: 240-159713-2

Date Collected: 11/05/21 14:31 — **Matrix: Water**
Date Received: 11/10/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 01:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*76*		*66 - 120*		*11/18/21 01:33*	

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 17:01	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 17:01	1
Tetrachloroethene	1.0	U *+	1.0	0.44	ug/L			11/17/21 17:01	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 17:01	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 17:01	1
Vinyl chloride	1.0	U *+	1.0	0.45	ug/L			11/17/21 17:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*62 - 137*		*11/17/21 17:01*	
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/17/21 17:01*	
Toluene-d8 (Surr)	*105*		*78 - 122*		*11/17/21 17:01*	
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*11/17/21 17:01*	

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159729-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/24/2021 8:36:20 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

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Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159729-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159729-1

Job ID: 240-159729-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159729-1

Comments
No additional comments.

Receipt
The samples were received on 11/10/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 0.7º C and 0.8º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159729-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159729-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159729-1	TRIP BLANK_42	Water	11/05/21 00:00	11/10/21 08:00
240-159729-2	MW-115S_110521	Water	11/05/21 11:16	11/10/21 08:00
240-159729-3	DUP-09	Water	11/05/21 00:00	11/10/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159729-1

Client Sample ID: TRIP BLANK_42 — Lab Sample ID: 240-159729-1

No Detections.

Client Sample ID: MW-115S_110521 — Lab Sample ID: 240-159729-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	0.69	J	1.0	0.45	ug/L	1		8260B	Total/NA

Client Sample ID: DUP-09 — Lab Sample ID: 240-159729-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	0.72	J	1.0	0.45	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159729-1

Client Sample ID: TRIP BLANK_42

Date Collected: 11/05/21 00:00
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159729-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 22:11	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 22:11	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 22:11	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 22:11	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 22:11	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 22:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*		*11/17/21 22:11*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/17/21 22:11*	*1*
Toluene-d8 (Surr)	*94*		*78 - 122*		*11/17/21 22:11*	*1*
Dibromofluoromethane (Surr)	*97*		*73 - 120*		*11/17/21 22:11*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159729-1

Client Sample ID: MW-115S_110521
Date Collected: 11/05/21 11:16
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159729-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 22:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*66 - 120*		*11/17/21 22:46*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 23:01	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 23:01	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 23:01	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 23:01	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 23:01	1
Vinyl chloride	**0.69**	**J**	1.0	0.45	ug/L			11/17/21 23:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/17/21 23:01*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/17/21 23:01*	*1*
Toluene-d8 (Surr)	*93*		*78 - 122*		*11/17/21 23:01*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/17/21 23:01*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159729-1

Client Sample ID: DUP-09
Date Collected: 11/05/21 00:00
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159729-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 23:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/17/21 23:10*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 23:26	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 23:26	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 23:26	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 23:26	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 23:26	1
Vinyl chloride	**0.72**	**J**	1.0	0.45	ug/L			11/17/21 23:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/17/21 23:26*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/17/21 23:26*	*1*
Toluene-d8 (Surr)	*94*		*78 - 122*		*11/17/21 23:26*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/17/21 23:26*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159729-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159660-B-9 MS	Matrix Spike	85	89	92	93
240-159660-B-9 MSD	Matrix Spike Duplicate	84	91	95	94
240-159729-1	TRIP BLANK_42	90	81	94	97
240-159729-2	MW-115S_110521	93	82	93	100
240-159729-3	DUP-09	92	81	94	100
LCS 240-513432/5	Lab Control Sample	87	89	95	93
MB 240-513432/8	Method Blank	93	83	92	100

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159642-H-3 MS	Matrix Spike	87
240-159642-M-3 MSD	Matrix Spike Duplicate	87
240-159729-2	MW-115S_110521	86
240-159729-3	DUP-09	85
LCS 240-513480/3	Lab Control Sample	84
MB 240-513480/4	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513432/8
Matrix: Water
Analysis Batch: 513432

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 14:39	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 14:39	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 14:39	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 14:39	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 14:39	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 14:39	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/17/21 14:39*	*1*
4-Bromofluorobenzene (Surr)	*83*		*56 - 136*		*11/17/21 14:39*	*1*
Toluene-d8 (Surr)	*92*		*78 - 122*		*11/17/21 14:39*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/17/21 14:39*	*1*

Lab Sample ID: LCS 240-513432/5
Matrix: Water
Analysis Batch: 513432

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	26.2		ug/L		105	63 - 134
cis-1,2-Dichloroethene	25.0	25.5		ug/L		102	77 - 123
Tetrachloroethene	25.0	26.7		ug/L		107	76 - 123
trans-1,2-Dichloroethene	25.0	25.8		ug/L		103	75 - 124
Trichloroethene	25.0	25.8		ug/L		103	70 - 122
Vinyl chloride	25.0	31.0		ug/L		124	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*87*		*62 - 137*
4-Bromofluorobenzene (Surr)	*89*		*56 - 136*
Toluene-d8 (Surr)	*95*		*78 - 122*
Dibromofluoromethane (Surr)	*93*		*73 - 120*

Lab Sample ID: 240-159660-B-9 MS
Matrix: Water
Analysis Batch: 513432

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10	U	250	253		ug/L		101	56 - 135
cis-1,2-Dichloroethene	280		250	534		ug/L		101	66 - 128
Tetrachloroethene	10	U	250	293		ug/L		117	62 - 131
trans-1,2-Dichloroethene	10	U	250	255		ug/L		102	56 - 136
Trichloroethene	180		250	447		ug/L		105	61 - 124
Vinyl chloride	10	U	250	190		ug/L		76	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*62 - 137*
4-Bromofluorobenzene (Surr)	*89*		*56 - 136*
Toluene-d8 (Surr)	*92*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159660-B-9 MS
Matrix: Water
Analysis Batch: 513432

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*93*		*73 - 120*

Lab Sample ID: 240-159660-B-9 MSD
Matrix: Water
Analysis Batch: 513432

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	10	U	250	263		ug/L		105	56 - 135	4	26
cis-1,2-Dichloroethene	280		250	506		ug/L		90	66 - 128	5	14
Tetrachloroethene	10	U	250	291		ug/L		116	62 - 131	1	20
trans-1,2-Dichloroethene	10	U	250	245		ug/L		98	56 - 136	4	15
Trichloroethene	180		250	433		ug/L		100	61 - 124	3	15
Vinyl chloride	10	U	250	184		ug/L		74	43 - 157	3	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*62 - 137*
4-Bromofluorobenzene (Surr)	*91*		*56 - 136*
Toluene-d8 (Surr)	*95*		*78 - 122*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513480/4
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 19:58	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/17/21 19:58*	*1*

Lab Sample ID: LCS 240-513480/3
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.37		ug/L		94	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*

Lab Sample ID: 240-159642-H-3 MS
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.3		ug/L		103	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

Lab Sample ID: 240-159642-M-3 MSD
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.57		ug/L		96	51 - 153	7	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159729-1

GC/MS VOA

Analysis Batch: 513432

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159729-1	TRIP BLANK_42	Total/NA	Water	8260B	
240-159729-2	MW-115S_110521	Total/NA	Water	8260B	
240-159729-3	DUP-09	Total/NA	Water	8260B	
MB 240-513432/8	Method Blank	Total/NA	Water	8260B	
LCS 240-513432/5	Lab Control Sample	Total/NA	Water	8260B	
240-159660-B-9 MS	Matrix Spike	Total/NA	Water	8260B	
240-159660-B-9 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 513480

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159729-2	MW-115S_110521	Total/NA	Water	8260B SIM	
240-159729-3	DUP-09	Total/NA	Water	8260B SIM	
MB 240-513480/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513480/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159642-H-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159642-M-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159729-1

Client Sample ID: TRIP BLANK_42

Lab Sample ID: 240-159729-1
Date Collected: 11/05/21 00:00
Matrix: Water
Date Received: 11/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513432	11/17/21 22:11	SAM	TAL CAN

Client Sample ID: MW-115S_110521

Lab Sample ID: 240-159729-2
Date Collected: 11/05/21 11:16
Matrix: Water
Date Received: 11/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513432	11/17/21 23:01	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	513480	11/17/21 22:46	CS	TAL CAN

Client Sample ID: DUP-09

Lab Sample ID: 240-159729-3
Date Collected: 11/05/21 00:00
Matrix: Water
Date Received: 11/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513432	11/17/21 23:26	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	513480	11/17/21 23:10	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159729-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN
190

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client: Lab sampling:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30080642.402.04	Shipping/Tracking No:			
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 42	---	---		X						1					N	G	X	X	X	X	X	X	X (EW)	1 Trip Blank
MW-1155-110521	11/05/21	11:16		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
DUP-09	11/05/21	—		X						6					N	G	X	X	X	X	X	X	X	

240-159729 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalla@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: Gary Schafer	Arcadis	11/08/21	1620	Received by: Novi cold storage	Arcadis	11/08/21	1620
Relinquished by:	ARCADIS	11/9/21	1040	Received by: Teri Hall	ETA	11/9/21	1040
Relinquished by: Teri Hall	ETA	11/9/21	1055	Received in Laboratory by: Mandolyn Block	ETA	11-10-21	8:00

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11/24/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 159729

Client Arcadis Site Name

Cooler Received on 11-10-21 Opened on 11-10-21

Cooler unpacked by: Marilyn Beer

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: ~~Bubble Wrap~~ Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt — See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity_____ Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
   -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? Yes No
11. Sufficient quantity received to perform indicated analyses? Yes No
12. Are these work share samples and all listed on the COC? Yes No
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC157842
14. Were VOAs on the COC? Yes No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this. Yes No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #_____ Yes No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

no SIM on TB per corrected COC. JMR 11/10/21

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

Login # : 159729

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form				
Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
TA Client Box Other	IR-14 IR-15	0-6	0-7	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15	0-7	0-8	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15	

DATA VERIFICATION REPORT

November 24, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159729-1
Sample date: 2021-11-05
Report received by CADENA: 2021-11-24
Initial Data Verification completed by CADENA: 2021-11-24
Number of Samples:3
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159729-1

		Sample Name:	TRIP BLANK_42				MW-115S_110521				DUP-09			
		Lab Sample ID:	2401597291				2401597292				2401597293			
		Sample Date:	11/5/2021				11/5/2021				11/5/2021			
Analyte	Cas No.		Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC														
OSW-8260B														
1,1-Dichloroethene	75-35-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4		ND	1.0	ug/l	---	0.69	1.0	ug/l	J	0.72	1.0	ug/l	J
OSW-8260BBSim														
1,4-Dioxane	123-91-1						ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

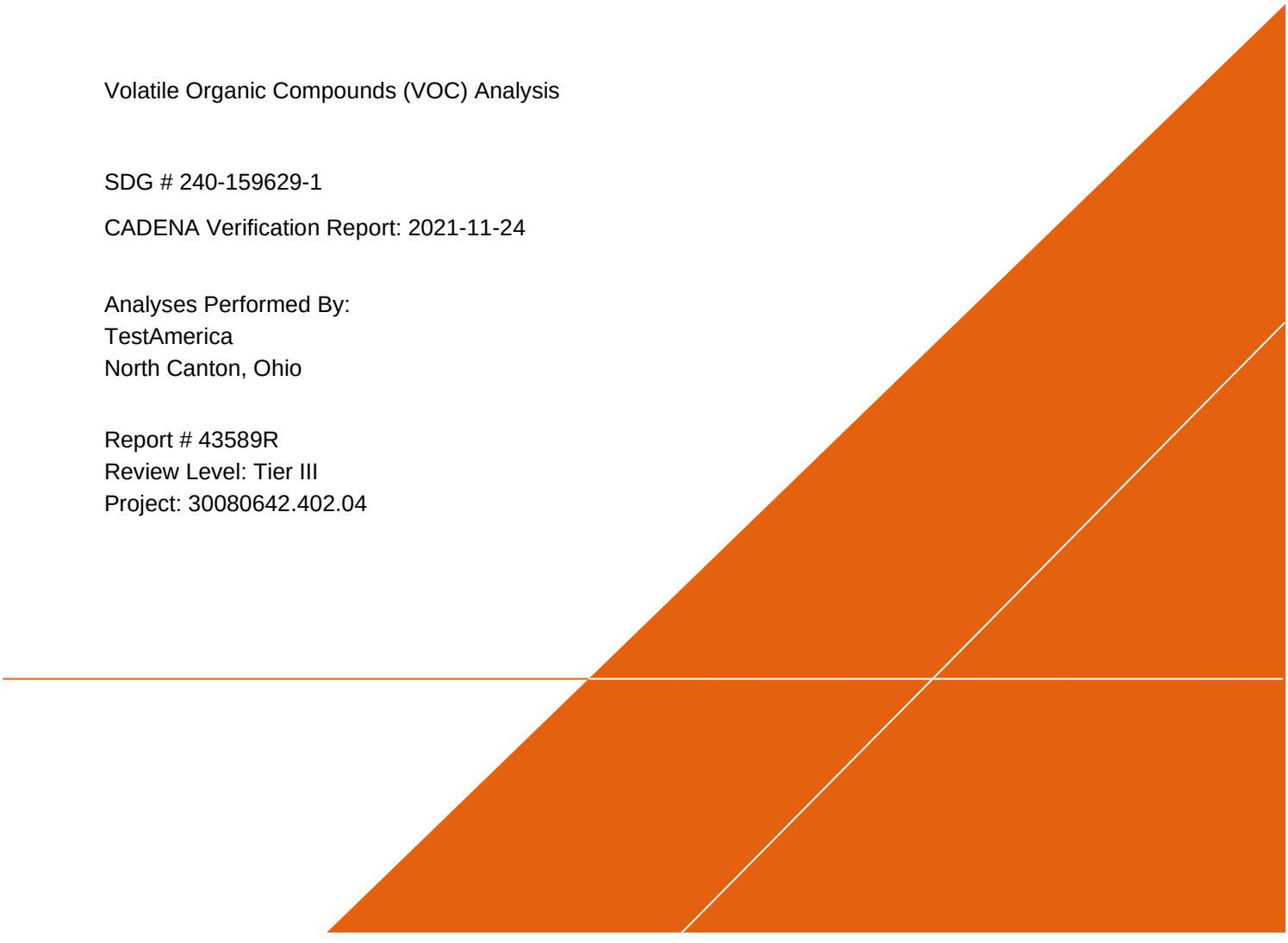
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159629-1

CADENA Verification Report: 2021-11-24

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43589R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159629-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_42	240-159729-1	Water	11/05/21		X	
MW-115S_110521	240-159729-2	Water	11/05/21		X	X
DUP-09	240-159729-3	Water	11/05/21	MW-115S_110521	X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result (µg/L)	Duplicate Result (µg/L)	RPD
MW-115S_110521 / DUP-09	Vinyl chloride	0.69	0.72	AC

Notes:

AC – Acceptable

The calculated differences between the parent sample and field duplicate were acceptable.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE: 

DATE: December 15, 2021

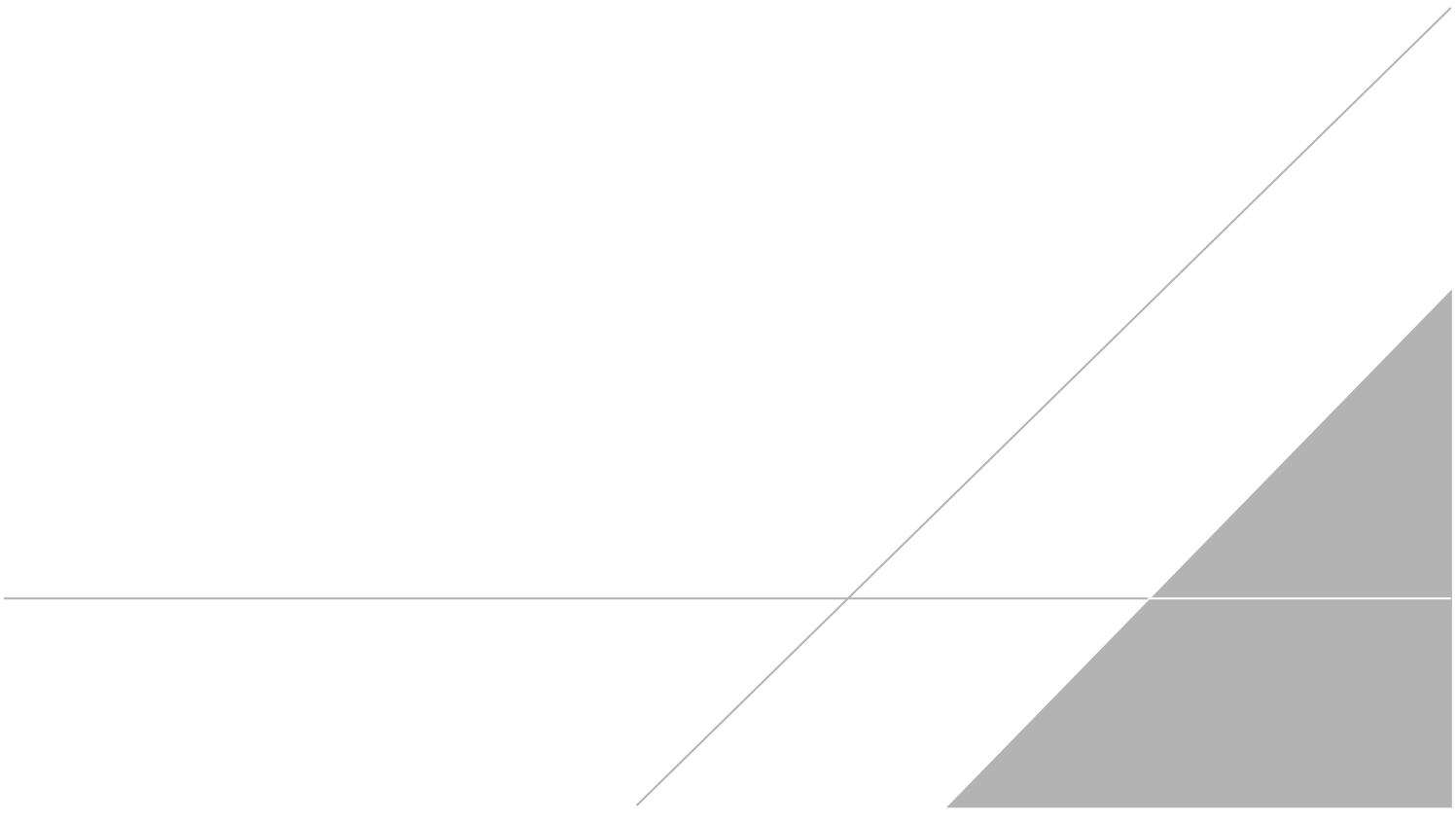
PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



MICHIGAN
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Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 42	---	---		X						1					N	G	X	X	X	X	X	X	X (EW)	1 Trip Blank
MW-1155-110521	11/05/21	11:16		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
DUP-09	11/05/21	—		X						6					N	G	X	X	X	X	X	X	X	

240-159729 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalla@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	11/08/21 1620	Novi cold storage	Arcadis	11/08/21 1620
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[illegible]	ARCADIS	11/9/21 / 1040	Jeri Hall	ETA	11/9/21 1040
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
Jeri Hall	ETA	11/9/21 1055	Mandolyn Block	ETA	11-10-21 8:00

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11/24/2021

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159729-1

Client Sample ID: TRIP BLANK_42

Date Collected: 11/05/21 00:00
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159729-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 22:11	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 22:11	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 22:11	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 22:11	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 22:11	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 22:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*		*11/17/21 22:11*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/17/21 22:11*	*1*
Toluene-d8 (Surr)	*94*		*78 - 122*		*11/17/21 22:11*	*1*
Dibromofluoromethane (Surr)	*97*		*73 - 120*		*11/17/21 22:11*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159729-1

Client Sample ID: MW-115S_110521
Date Collected: 11/05/21 11:16
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159729-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 22:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*66 - 120*		*11/17/21 22:46*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 23:01	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 23:01	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 23:01	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 23:01	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 23:01	1
Vinyl chloride	**0.69**	**J**	1.0	0.45	ug/L			11/17/21 23:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/17/21 23:01*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/17/21 23:01*	*1*
Toluene-d8 (Surr)	*93*		*78 - 122*		*11/17/21 23:01*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/17/21 23:01*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159729-1

Client Sample ID: DUP-09
Date Collected: 11/05/21 00:00
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159729-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 23:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/17/21 23:10*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 23:26	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 23:26	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 23:26	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 23:26	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 23:26	1
Vinyl chloride	**0.72**	**J**	1.0	0.45	ug/L			11/17/21 23:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/17/21 23:26*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/17/21 23:26*	*1*
Toluene-d8 (Surr)	*94*		*78 - 122*		*11/17/21 23:26*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/17/21 23:26*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159724-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/24/2021 8:31:09 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159724-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159724-1

Job ID: 240-159724-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159724-1

Comments
No additional comments.

Receipt
The samples were received on 11/10/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 0.7º C and 0.8º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159724-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159724-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159724-1	TRIP BLANK_82	Water	11/08/21 00:00	11/10/21 08:00
240-159724-2	MW-123S_110821	Water	11/08/21 09:42	11/10/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159724-1

Client Sample ID: TRIP BLANK_82 — Lab Sample ID: 240-159724-1

No Detections.

Client Sample ID: MW-123S_110821 — Lab Sample ID: 240-159724-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	2.8		1.0	0.45	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159724-1

Client Sample ID: TRIP BLANK_82
Date Collected: 11/08/21 00:00
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159724-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 20:28	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 20:28	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 20:28	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 20:28	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 20:28	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 20:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*118*		*62 - 137*		*11/17/21 20:28*	*1*
4-Bromofluorobenzene (Surr)	*69*		*56 - 136*		*11/17/21 20:28*	*1*
Toluene-d8 (Surr)	*86*		*78 - 122*		*11/17/21 20:28*	*1*
Dibromofluoromethane (Surr)	*103*		*73 - 120*		*11/17/21 20:28*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159724-1

Client Sample ID: MW-123S_110821
Date Collected: 11/08/21 09:42
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159724-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 21:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*66 - 120*		*11/17/21 21:58*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 20:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 20:50	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 20:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 20:50	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 20:50	1
Vinyl chloride	**2.8**		1.0	0.45	ug/L			11/17/21 20:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*62 - 137*		*11/17/21 20:50*	*1*
4-Bromofluorobenzene (Surr)	*67*		*56 - 136*		*11/17/21 20:50*	*1*
Toluene-d8 (Surr)	*87*		*78 - 122*		*11/17/21 20:50*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/17/21 20:50*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159724-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159724-1	TRIP BLANK_82	118	69	86	103
240-159724-2	MW-123S_110821	119	67	87	100
240-159724-2 MS	MW-123S_110821	96	99	103	84
240-159724-2 MSD	MW-123S_110821	97	97	106	86
LCS 240-513417/4	Lab Control Sample	93	97	98	84
MB 240-513417/7	Method Blank	105	76	89	91

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159642-H-3 MS	Matrix Spike	87
240-159642-M-3 MSD	Matrix Spike Duplicate	87
240-159724-2	MW-123S_110821	89
LCS 240-513480/3	Lab Control Sample	84
MB 240-513480/4	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513417/7
Matrix: Water
Analysis Batch: 513417

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 13:33	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 13:33	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 13:33	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 13:33	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 13:33	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 13:33	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/17/21 13:33*	*1*
4-Bromofluorobenzene (Surr)	*76*		*56 - 136*		*11/17/21 13:33*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/17/21 13:33*	*1*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*11/17/21 13:33*	*1*

Lab Sample ID: LCS 240-513417/4
Matrix: Water
Analysis Batch: 513417

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.24		ug/L		92	63 - 134
cis-1,2-Dichloroethene	10.0	9.72		ug/L		97	77 - 123
Tetrachloroethene	10.0	9.53		ug/L		95	76 - 123
trans-1,2-Dichloroethene	10.0	10.1		ug/L		101	75 - 124
Trichloroethene	10.0	8.80		ug/L		88	70 - 122
Vinyl chloride	10.0	11.6		ug/L		116	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*97*		*56 - 136*
Toluene-d8 (Surr)	*98*		*78 - 122*
Dibromofluoromethane (Surr)	*84*		*73 - 120*

Lab Sample ID: 240-159724-2 MS
Matrix: Water
Analysis Batch: 513417

Client Sample ID: MW-123S_110821
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	8.39		ug/L		84	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	8.85		ug/L		88	66 - 128
Tetrachloroethene	1.0	U	10.0	8.96		ug/L		90	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.58		ug/L		96	56 - 136
Trichloroethene	1.0	U	10.0	7.89		ug/L		79	61 - 124
Vinyl chloride	2.8		10.0	14.2		ug/L		114	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*
4-Bromofluorobenzene (Surr)	*99*		*56 - 136*
Toluene-d8 (Surr)	*103*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159724-2 MS
Matrix: Water
Analysis Batch: 513417

Client Sample ID: MW-123S_110821
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	*84*		*73 - 120*

Lab Sample ID: 240-159724-2 MSD
Matrix: Water
Analysis Batch: 513417

Client Sample ID: MW-123S_110821
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	7.80		ug/L		78	56 - 135	7	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.45		ug/L		95	66 - 128	7	14
Tetrachloroethene	1.0	U	10.0	9.27		ug/L		93	62 - 131	3	20
trans-1,2-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	56 - 136	8	15
Trichloroethene	1.0	U	10.0	8.32		ug/L		83	61 - 124	5	15
Vinyl chloride	2.8		10.0	15.8		ug/L		130	43 - 157	11	24

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*97*		*62 - 137*
4-Bromofluorobenzene (Surr)	*97*		*56 - 136*
Toluene-d8 (Surr)	*106*		*78 - 122*
Dibromofluoromethane (Surr)	*86*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513480/4
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 19:58	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/17/21 19:58*	*1*

Lab Sample ID: LCS 240-513480/3
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.37		ug/L		94	80 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*

Lab Sample ID: 240-159642-H-3 MS
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.3		ug/L		103	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

Lab Sample ID: 240-159642-M-3 MSD
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.57		ug/L		96	51 - 153	7	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159724-1

GC/MS VOA

Analysis Batch: 513417

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159724-1	TRIP BLANK_82	Total/NA	Water	8260B	
240-159724-2	MW-123S_110821	Total/NA	Water	8260B	
MB 240-513417/7	Method Blank	Total/NA	Water	8260B	
LCS 240-513417/4	Lab Control Sample	Total/NA	Water	8260B	
240-159724-2 MS	MW-123S_110821	Total/NA	Water	8260B	
240-159724-2 MSD	MW-123S_110821	Total/NA	Water	8260B	

Analysis Batch: 513480

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159724-2	MW-123S_110821	Total/NA	Water	8260B SIM	
MB 240-513480/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513480/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159642-H-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159642-M-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159724-1

Client Sample ID: TRIP BLANK_82

Lab Sample ID: 240-159724-1

Date Collected: 11/08/21 00:00

Matrix: Water

Date Received: 11/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513417	11/17/21 20:28	LEE	TAL CAN

Client Sample ID: MW-123S_110821

Lab Sample ID: 240-159724-2

Date Collected: 11/08/21 09:42

Matrix: Water

Date Received: 11/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513417	11/17/21 20:50	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513480	11/17/21 21:58	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159724-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Sommer Guy		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30080642.402.04	Shipping/Tracking No:		
PO # 30080642.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below: 10 day; 3 weeks; 2 weeks; 1 week; 2 days; 1 day

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 82	—	—		X						1					N	G	X	X	X	X	X	X	~~X~~	1 Trip Blank
MW-123S-110821	11/8/21	9:42		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159724 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Sommer Guy	Arcadis	11/8/21 15:30	Novi Cold Storage	Arcadis	11/8/21 15:30
[signature]	ARCADIS	~~11/8~~ 11/9/21 /1040	[signature]	ETA	11/9/21 1040
[signature]	ETA	11/9/21 1055	Mandolyn Blood	ETA	11-10-21 8:00

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159724**
Canton Facility

Client Arcadis Site Name

Cooler Received on 11-10-21 Opened on 11-10-21

Cooler unpacked by: Marilyn Bleau

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity_____	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC157842
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #_____	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page | Samples processed by:

no SIM on TB per corrected COC. TME 11/10/21

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

Login # : 159724

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form			
Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
TA Client Box Other	IR-14 IR-15	0.6	0.7	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15	0.7	0.8	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15	

DATA VERIFICATION REPORT

November 25, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159724-1
Sample date: 2021-11-08
Report received by CADENA: 2021-11-24
Initial Data Verification completed by CADENA: 2021-11-25
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159724-1

		Sample Name:	TRIP BLANK_82				MW-123S_110821			
		Lab Sample ID:	2401597241				2401597242			
		Sample Date:	11/8/2021				11/8/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	2.8	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

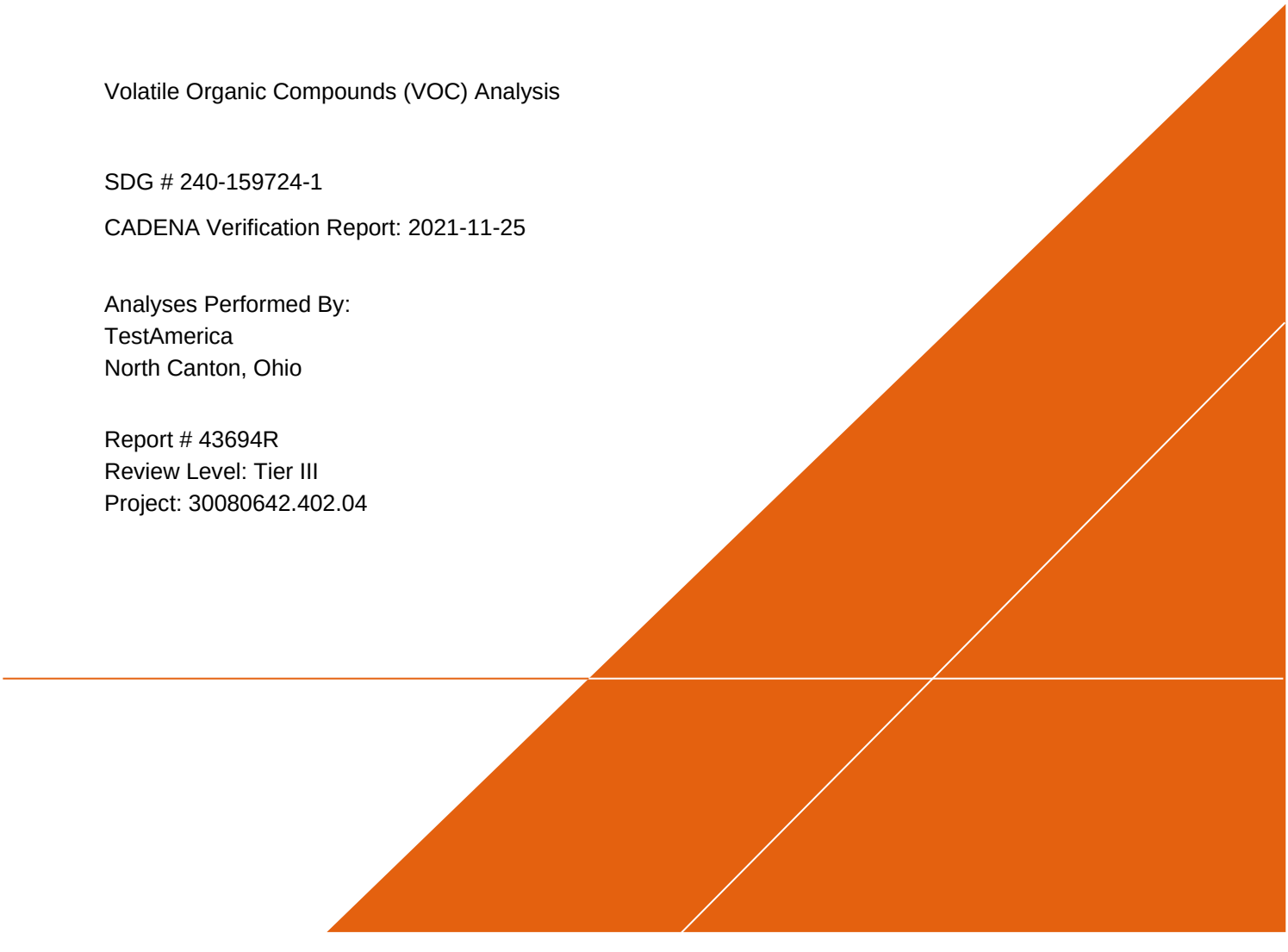
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159724-1

CADENA Verification Report: 2021-11-25

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43694R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159724-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_82	240-159724-1	Water	11/08/21		X	
MW-123S_110821	240-159724-2	Water	11/08/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 13, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No: 1 of 1 COCs
Phone: 248-994-2240	Sampler Name: Sommer Guy	TAT if different from below	For lab use only
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:	10 day — 3 weeks / 2 weeks / 1 week / 2 days / 1 day	Walk-in client
Project Number: 30080642.402.04	Shipping/Tracking No:		Lab sampling
PO # 30080642.402.04			Job/SDG No:

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_82	—	—		X						1					N	G	X	X	X	X	X	X	* (aw)	1 Trip Blank
MW-1235-110821	11/8/21	9:42		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159724 Chain of Custody

Possible Hazard Identification: Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / Disposal By Lab / Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Sommer Guy	Arcadis	11/8/21 15:30	Novi Cold Storage	Arcadis	11/8/21 15:30
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	ARCADIS	11/9/21 (aw) 1040	[signature]	E+A	11/9/21 1040
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
[signature]	E+A	11/9/21 1055	Mandy Block	E+A	11-10-21 8:00

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Client Sample ID: TRIP BLANK_82
Lab Sample ID: 240-159724-1
Date Collected: 11/08/21 00:00
Matrix: Water
Date Received: 11/10/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 20:28	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 20:28	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 20:28	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 20:28	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 20:28	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 20:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*118*		*62 - 137*		*11/17/21 20:28*	*1*
4-Bromofluorobenzene (Surr)	*69*		*56 - 136*		*11/17/21 20:28*	*1*
Toluene-d8 (Surr)	*86*		*78 - 122*		*11/17/21 20:28*	*1*
Dibromofluoromethane (Surr)	*103*		*73 - 120*		*11/17/21 20:28*	*1*

Client Sample ID: MW-123S_110821
Lab Sample ID: 240-159724-2
Date Collected: 11/08/21 09:42
Matrix: Water
Date Received: 11/10/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 21:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*66 - 120*		*11/17/21 21:58*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 20:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 20:50	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 20:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 20:50	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 20:50	1
Vinyl chloride	**2.8**		1.0	0.45	ug/L			11/17/21 20:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*62 - 137*		*11/17/21 20:50*	*1*
4-Bromofluorobenzene (Surr)	*67*		*56 - 136*		*11/17/21 20:50*	*1*
Toluene-d8 (Surr)	*87*		*78 - 122*		*11/17/21 20:50*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/17/21 20:50*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159830-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/26/2021 7:54:30 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159830-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159830-1

Job ID: 240-159830-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159830-1

Comments
No additional comments.

Receipt
The samples were received on 11/11/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 4.6º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159830-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159830-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159830-1	TRIP BLANK_86	Water	11/09/21 00:00	11/11/21 08:00
240-159830-2	MW-148S_110921	Water	11/09/21 13:55	11/11/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159830-1

Client Sample ID: TRIP BLANK_86 — Lab Sample ID: 240-159830-1

No Detections.

Client Sample ID: MW-148S_110921 — Lab Sample ID: 240-159830-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159830-1

Client Sample ID: TRIP BLANK_86

Date Collected: 11/09/21 00:00
Date Received: 11/11/21 08:00

Lab Sample ID: 240-159830-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 06:47	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 06:47	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 06:47	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 06:47	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 06:47	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 06:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*62 - 137*		*11/19/21 06:47*	*1*
4-Bromofluorobenzene (Surr)	*83*		*56 - 136*		*11/19/21 06:47*	*1*
Toluene-d8 (Surr)	*101*		*78 - 122*		*11/19/21 06:47*	*1*
Dibromofluoromethane (Surr)	*107*		*73 - 120*		*11/19/21 06:47*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159830-1

Client Sample ID: MW-148S_110921
Date Collected: 11/09/21 13:55
Date Received: 11/11/21 08:00

Lab Sample ID: 240-159830-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 22:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*		*11/12/21 22:15*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 07:09	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 07:09	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 07:09	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 07:09	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 07:09	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 07:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*62 - 137*		*11/19/21 07:09*	*1*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*		*11/19/21 07:09*	*1*
Toluene-d8 (Surr)	*98*		*78 - 122*		*11/19/21 07:09*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/19/21 07:09*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159830-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159830-1	TRIP BLANK_86	119	83	101	107
240-159830-2	MW-148S_110921	110	78	98	96
240-159830-2 MS	MW-148S_110921	110	86	101	96
240-159830-2 MSD	MW-148S_110921	107	84	97	94
LCS 240-513667/4	Lab Control Sample	101	85	107	94
MB 240-513667/6	Method Blank	110	81	108	98

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159541-G-2 MS	Matrix Spike	77
240-159541-M-2 MSD	Matrix Spike Duplicate	78
240-159830-2	MW-148S_110921	75
LCS 240-512785/4	Lab Control Sample	79
MB 240-512785/5	Method Blank	79

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513667/6
Matrix: Water
Analysis Batch: 513667

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/18/21 23:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/18/21 23:24	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 23:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/18/21 23:24	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/18/21 23:24	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/18/21 23:24	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*62 - 137*		*11/18/21 23:24*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/18/21 23:24*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/18/21 23:24*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/18/21 23:24*	*1*

Lab Sample ID: LCS 240-513667/4
Matrix: Water
Analysis Batch: 513667

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.6		ug/L		106	63 - 134
cis-1,2-Dichloroethene	10.0	10.7		ug/L		107	77 - 123
Tetrachloroethene	10.0	12.0		ug/L		120	76 - 123
trans-1,2-Dichloroethene	10.0	10.6		ug/L		106	75 - 124
Trichloroethene	10.0	9.72		ug/L		97	70 - 122
Vinyl chloride	10.0	7.48		ug/L		75	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*101*		*62 - 137*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*
Toluene-d8 (Surr)	*107*		*78 - 122*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: 240-159830-2 MS
Matrix: Water
Analysis Batch: 513667

Client Sample ID: MW-148S_110921
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	8.06		ug/L		81	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.32		ug/L		93	66 - 128
Tetrachloroethene	1.0	U	10.0	9.01		ug/L		90	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.50		ug/L		95	56 - 136
Trichloroethene	1.0	U	10.0	8.17		ug/L		82	61 - 124
Vinyl chloride	1.0	U	10.0	7.02		ug/L		70	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*110*		*62 - 137*
4-Bromofluorobenzene (Surr)	*86*		*56 - 136*
Toluene-d8 (Surr)	*101*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159830-2 MS
Matrix: Water
Analysis Batch: 513667

Client Sample ID: MW-148S_110921
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	96		73 - 120

Lab Sample ID: 240-159830-2 MSD
Matrix: Water
Analysis Batch: 513667

Client Sample ID: MW-148S_110921
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	7.67		ug/L		77	56 - 135	5	26
cis-1,2-Dichloroethene	1.0	U	10.0	8.48		ug/L		85	66 - 128	9	14
Tetrachloroethene	1.0	U	10.0	8.29		ug/L		83	62 - 131	8	20
trans-1,2-Dichloroethene	1.0	U	10.0	8.31		ug/L		83	56 - 136	13	15
Trichloroethene	1.0	U	10.0	7.56		ug/L		76	61 - 124	8	15
Vinyl chloride	1.0	U	10.0	6.48		ug/L		65	43 - 157	8	24

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	107		62 - 137
4-Bromofluorobenzene (Surr)	84		56 - 136
Toluene-d8 (Surr)	97		78 - 122
Dibromofluoromethane (Surr)	94		73 - 120

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512785/5
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 18:32	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	79		66 - 120		11/12/21 18:32	1

Lab Sample ID: LCS 240-512785/4
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.7		ug/L		107	80 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	79		66 - 120

Lab Sample ID: 240-159541-G-2 MS
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

Lab Sample ID: 240-159541-M-2 MSD
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.4		ug/L		104	51 - 153	2	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159830-1

GC/MS VOA

Analysis Batch: 512785

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159830-2	MW-148S_110921	Total/NA	Water	8260B SIM	
MB 240-512785/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512785/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159541-G-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159541-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513667

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159830-1	TRIP BLANK_86	Total/NA	Water	8260B	
240-159830-2	MW-148S_110921	Total/NA	Water	8260B	
MB 240-513667/6	Method Blank	Total/NA	Water	8260B	
LCS 240-513667/4	Lab Control Sample	Total/NA	Water	8260B	
240-159830-2 MS	MW-148S_110921	Total/NA	Water	8260B	
240-159830-2 MSD	MW-148S_110921	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159830-1

Client Sample ID: TRIP BLANK_86

Lab Sample ID: 240-159830-1

Date Collected: 11/09/21 00:00

Matrix: Water

Date Received: 11/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513667	11/19/21 06:47	LEE	TAL CAN

Client Sample ID: MW-148S_110921

Lab Sample ID: 240-159830-2

Date Collected: 11/09/21 13:55

Matrix: Water

Date Received: 11/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513667	11/19/21 07:09	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512785	11/12/21 22:15	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159830-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Sommer Guy	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_86	—	—		X						1							X	X	X	X	X	X	X	1 Trip Blank
MW-148S-110921	11/9/21	13:55		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159830 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal ByLab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company:	Date/Time:		Company:	Date/Time:
Relinquished by: Sommer Guy	Arcadis	11/9/21 15:00	Received by: Novi Cold storage	Arcadis	11/9/21 15:00
Relinquished by:	Arcadis	11/10/21	Received by:	GTA	11/10/21 1030
Relinquished by:	GTA	11/10/21 1045	Received in Laboratory by:	ETA	11-11-21 800

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11/26/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159830**
Canton Facility

Client Arcadis Site Name

Cooler Received on 11-11-21 Opened on 11-11-21

Cooler unpacked by: Tammy Berg

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # 1A Foam Box Client Cooler Box Other

Packing material used: ~~Bubble Wrap~~ Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 4.5 °C Corrected Cooler Temp. 4.6 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# **HC157842**
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 600358 (Yes) No
17. Was a LL Hg or Me Hg trip blank present? Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

no SFM on TB per corrected COC. MWD 11/11/21

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

November 26, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159830-1
Sample date: 2021-11-09
Report received by CADENA: 2021-11-26
Initial Data Verification completed by CADENA: 2021-11-26
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159830-1

		Sample Name:	TRIP BLANK_86				MW-148S_110921			
		Lab Sample ID:	2401598301				2401598302			
		Sample Date:	11/9/2021				11/9/2021			
	Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC										
	OSW-8260B									
	1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	OSW-8260BBSim									
	1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

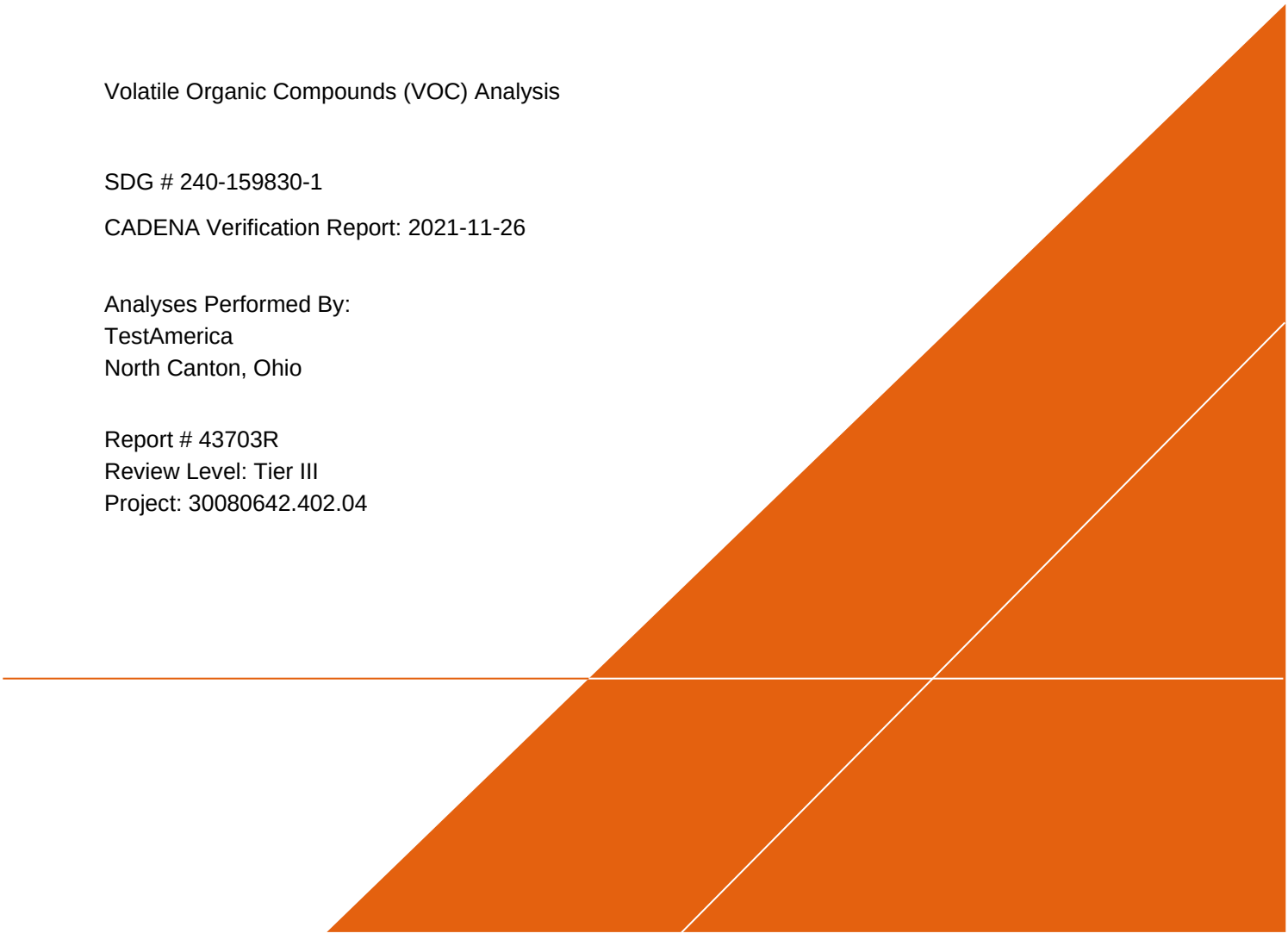
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159830-1

CADENA Verification Report: 2021-11-26

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43703R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159830-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_86	240-159830-1	Water	11/09/21		X	
MW-148S_110921	240-159830-2	Water	11/09/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 14, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 14, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

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Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Sommer Guy	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_86	—	—		X						1							X	X	X	X	X	X	X	1 Trip Blank
MW-14S-110921	11/9/21	13:55		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159830 Chain of Custody

Possible Hazard Identification
Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Return to Client Disposal ByLab Archive For Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company:	Date/Time:		Company:	Date/Time:
Relinquished by: Sommer Guy	Arcadis	11/9/21 15:00	Received by: Novi Cold storage	Arcadis	11/9/21 15:00
Relinquished by: Julia McClafferty	Arcadis	11/10/21	Received by:	GTA	11/10/21 1036
Relinquished by:	GTA	11/10/21 1045	Received in Laboratory by: Tawny Boyer	ETA	11-11-21 800

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Client Sample ID: TRIP BLANK_86
Lab Sample ID: 240-159830-1
Date Collected: 11/09/21 00:00
Matrix: Water
Date Received: 11/11/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 06:47	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 06:47	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 06:47	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 06:47	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 06:47	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 06:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*62 - 137*		*11/19/21 06:47*	*1*
4-Bromofluorobenzene (Surr)	*83*		*56 - 136*		*11/19/21 06:47*	*1*
Toluene-d8 (Surr)	*101*		*78 - 122*		*11/19/21 06:47*	*1*
Dibromofluoromethane (Surr)	*107*		*73 - 120*		*11/19/21 06:47*	*1*

Client Sample ID: MW-148S_110921
Lab Sample ID: 240-159830-2
Date Collected: 11/09/21 13:55
Matrix: Water
Date Received: 11/11/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 22:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*		*11/12/21 22:15*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 07:09	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 07:09	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 07:09	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 07:09	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 07:09	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 07:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*62 - 137*		*11/19/21 07:09*	*1*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*		*11/19/21 07:09*	*1*
Toluene-d8 (Surr)	*98*		*78 - 122*		*11/19/21 07:09*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/19/21 07:09*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159622-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/22/2021 3:38:05 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159622-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159622-1

Job ID: 240-159622-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159622-1

Comments
No additional comments.

Receipt
The samples were received on 11/9/2021 10:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 3.7º C and 3.8º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159622-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159622-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159622-1	TRIP BLANK_63	Water	11/05/21 00:00	11/09/21 10:00
240-159622-2	MW-117S_110521	Water	11/05/21 12:30	11/09/21 10:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159622-1

Client Sample ID: TRIP BLANK_63 — Lab Sample ID: 240-159622-1

No Detections.

Client Sample ID: MW-117S_110521 — Lab Sample ID: 240-159622-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Trichloroethene	0.52	J	1.0	0.44	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159622-1

Client Sample ID: TRIP BLANK_63
Date Collected: 11/05/21 00:00
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159622-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 16:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 16:52	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 16:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 16:52	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 16:52	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 16:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/16/21 16:52*	*1*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*		*11/16/21 16:52*	*1*
Toluene-d8 (Surr)	*96*		*78 - 122*		*11/16/21 16:52*	*1*
Dibromofluoromethane (Surr)	*105*		*73 - 120*		*11/16/21 16:52*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159622-1

Client Sample ID: MW-117S_110521
Date Collected: 11/05/21 12:30
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159622-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/16/21 22:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*11/16/21 22:59*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 20:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 20:24	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 20:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 20:24	1
Trichloroethene	**0.52**	**J**	1.0	0.44	ug/L			11/16/21 20:24	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 20:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/16/21 20:24*	*1*
4-Bromofluorobenzene (Surr)	*93*		*56 - 136*		*11/16/21 20:24*	*1*
Toluene-d8 (Surr)	*99*		*78 - 122*		*11/16/21 20:24*	*1*
Dibromofluoromethane (Surr)	*118*		*73 - 120*		*11/16/21 20:24*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159622-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159622-1	TRIP BLANK_63	93	87	96	105
240-159622-2	MW-117S_110521	105	93	99	118
240-159636-F-2 MS	Matrix Spike	93	93	102	105
240-159636-G-2 MSD	Matrix Spike Duplicate	93	94	103	105
LCS 240-513208/5	Lab Control Sample	86	91	100	101
MB 240-513208/8	Method Blank	91	87	98	108

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159546-G-2 MS	Matrix Spike	82
240-159546-M-2 MSD	Matrix Spike Duplicate	85
240-159622-2	MW-117S_110521	83
LCS 240-513286/4	Lab Control Sample	82
MB 240-513286/5	Method Blank	85

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513208/8
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 14:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 14:06	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 14:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 14:06	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 14:06	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 14:06	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*62 - 137*		*11/16/21 14:06*	*1*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*		*11/16/21 14:06*	*1*
Toluene-d8 (Surr)	*98*		*78 - 122*		*11/16/21 14:06*	*1*
Dibromofluoromethane (Surr)	*108*		*73 - 120*		*11/16/21 14:06*	*1*

Lab Sample ID: LCS 240-513208/5
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	28.3		ug/L		113	63 - 134
cis-1,2-Dichloroethene	25.0	26.1		ug/L		104	77 - 123
Tetrachloroethene	25.0	29.3		ug/L		117	76 - 123
trans-1,2-Dichloroethene	25.0	27.4		ug/L		110	75 - 124
Trichloroethene	25.0	27.4		ug/L		110	70 - 122
Vinyl chloride	25.0	24.0		ug/L		96	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*
4-Bromofluorobenzene (Surr)	*91*		*56 - 136*
Toluene-d8 (Surr)	*100*		*78 - 122*
Dibromofluoromethane (Surr)	*101*		*73 - 120*

Lab Sample ID: 240-159636-F-2 MS
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	25.0	25.8		ug/L		103	56 - 135
cis-1,2-Dichloroethene	1.0	U	25.0	24.8		ug/L		99	66 - 128
Tetrachloroethene	1.0	U	25.0	28.9		ug/L		116	62 - 131
trans-1,2-Dichloroethene	1.0	U	25.0	25.3		ug/L		101	56 - 136
Trichloroethene	1.0	U	25.0	25.4		ug/L		101	61 - 124
Vinyl chloride	1.0	U	25.0	22.2		ug/L		89	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*93*		*56 - 136*
Toluene-d8 (Surr)	*102*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159636-F-2 MS
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*105*		*73 - 120*

Lab Sample ID: 240-159636-G-2 MSD
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	25.0	25.9		ug/L		104	56 - 135	0	26
cis-1,2-Dichloroethene	1.0	U	25.0	25.0		ug/L		100	66 - 128	1	14
Tetrachloroethene	1.0	U	25.0	29.5		ug/L		118	62 - 131	2	20
trans-1,2-Dichloroethene	1.0	U	25.0	25.1		ug/L		100	56 - 136	1	15
Trichloroethene	1.0	U	25.0	25.3		ug/L		101	61 - 124	0	15
Vinyl chloride	1.0	U	25.0	22.3		ug/L		89	43 - 157	1	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*
Toluene-d8 (Surr)	*103*		*78 - 122*
Dibromofluoromethane (Surr)	*105*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513286/5
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/16/21 19:44	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/16/21 19:44*	*1*

Lab Sample ID: LCS 240-513286/4
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.78		ug/L		98	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159546-G-2 MS
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	11.0		ug/L		110	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159546-M-2 MSD
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.83		ug/L		98	51 - 153	11	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159622-1

GC/MS VOA

Analysis Batch: 513208

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159622-1	TRIP BLANK_63	Total/NA	Water	8260B	
240-159622-2	MW-117S_110521	Total/NA	Water	8260B	
MB 240-513208/8	Method Blank	Total/NA	Water	8260B	
LCS 240-513208/5	Lab Control Sample	Total/NA	Water	8260B	
240-159636-F-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159636-G-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 513286

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159622-2	MW-117S_110521	Total/NA	Water	8260B SIM	
MB 240-513286/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513286/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159546-G-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159546-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159622-1

Client Sample ID: TRIP BLANK_63

Lab Sample ID: 240-159622-1

Date Collected: 11/05/21 00:00

Matrix: Water

Date Received: 11/09/21 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513208	11/16/21 16:52	SAM	TAL CAN

Client Sample ID: MW-117S_110521

Lab Sample ID: 240-159622-2

Date Collected: 11/05/21 12:30

Matrix: Water

Date Received: 11/09/21 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513208	11/16/21 20:24	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	513286	11/16/21 22:59	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159622-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

MICHIGAN 190 TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Andrew Barth	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client; Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30080642.402.04	Shipping/Tracking No:			
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_63	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1175_110521	11/5/21	1230		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159622 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Arcadis	11/5/21 1500	Novi Cold Storage	Arcadis	11/5/21 1500
	Arcadis	11/8/21 1200		ETA	11/8/21 1200
	ETA	11/8/21	Received in Laboratory by:	ETA	11-9-21 1000

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11/22/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 159622
Canton Facility

Client ARCADIS Site Name _____ Cooler unpacked by: Tammy Dayer

Cooler Received on 11-9-21 Opened on 11-9-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 2 Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
   -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? Yes No
11. Sufficient quantity received to perform indicated analyses? Yes No yes 11/11/21
12. Are these work share samples and all listed on the COC? Yes No
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# **HC157842**
14. Were VOAs on the COC? Yes No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 60358 Yes No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page Samples processed by:

The TB is not logged for SIM ~~due to insufficient volume.~~ 11-9-21
per corrected COC 11/11/21

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

WI-NC-099

Login # : 159622

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form				
Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
(TA) Client Box Other	(IR-14) IR-15	3.6	3.7	(Wet Ice) Blue Ice Dry Ice Water None
(TA) Client Box Other	(IR-14) IR-15	3.7	3.8	(Wet Ice) Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice

DATA VERIFICATION REPORT

November 22, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159622-1
Sample date: 2021-11-05
Report received by CADENA: 2021-11-22
Initial Data Verification completed by CADENA: 2021-11-22
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159622-1

		Sample Name:	TRIP BLANK_63				MW-117S_110521			
		Lab Sample ID:	2401596221				2401596222			
		Sample Date:	11/5/2021				11/5/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	0.52	1.0	ug/l	J
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

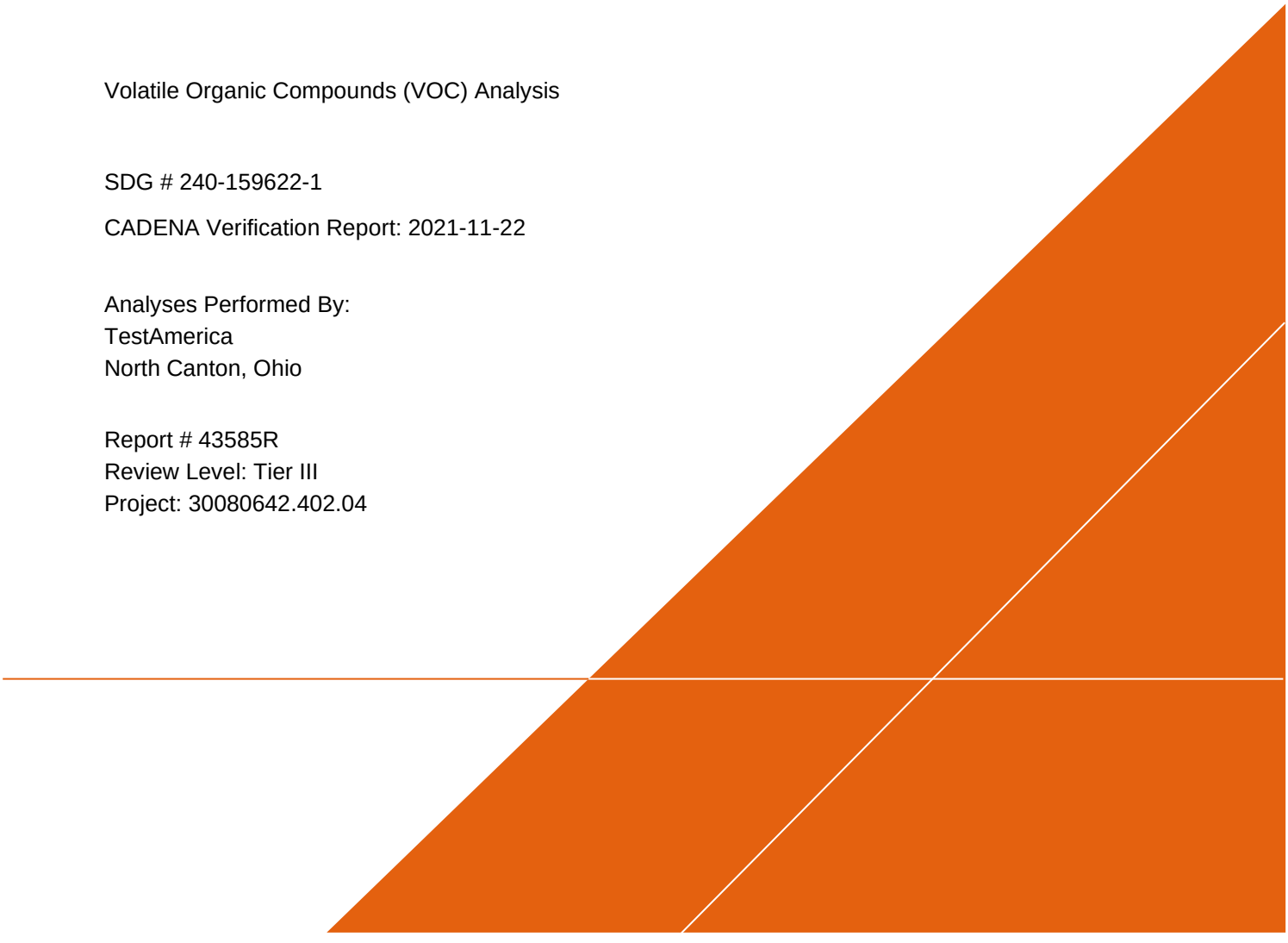
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159622-1

CADENA Verification Report: 2021-11-22

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43585R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159622-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_63	240-159622-1	Water	11/05/21		X	
MW-117S_110521	240-159622-2	Water	11/05/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

DATA REVIEW

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE: 

DATE: December 14, 2021

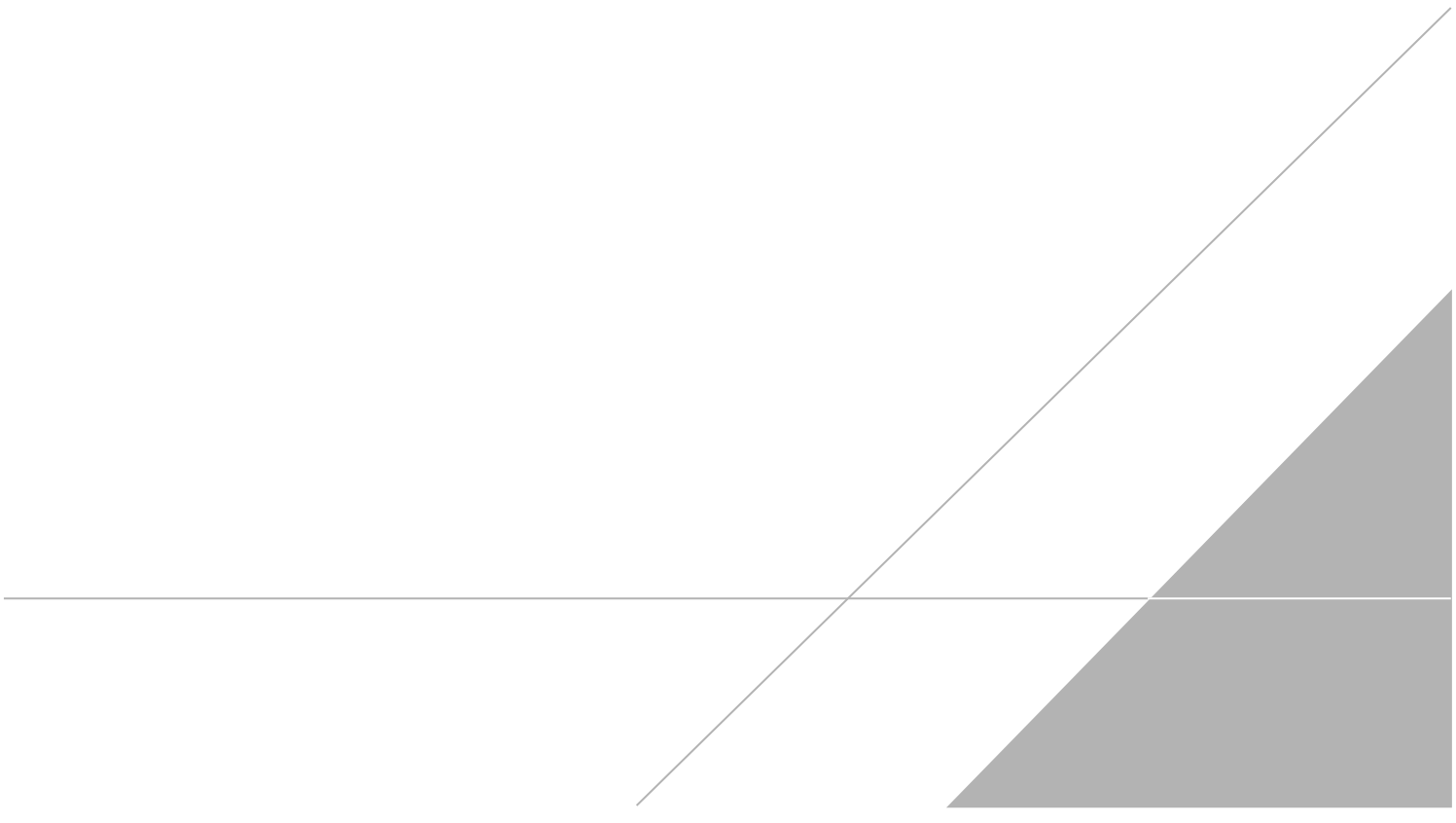
PEER REVIEW: Andrew Korycinski

DATE: December 14, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



Chain of Custody Record

MICHIGAN 190 TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Andrew Barth	TAT if different from below: ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:	10 day		Lab sampling:
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_63	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1175_110521	11/5/21	1230		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159622 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Arcadis	11/5/21 1500	Novi Cold Storage	Arcadis	11/5/21 1500
	Arcadis	11/8/21 1200		ETA	11/8/21 1200
	ETA	11/8/21	Received in Laboratory by:	ETA	11-9-21 1000

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11/22/2021

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159622-1

Client Sample ID: TRIP BLANK_63
Date Collected: 11/05/21 00:00
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159622-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 16:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 16:52	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 16:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 16:52	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 16:52	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 16:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/16/21 16:52*	*1*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*		*11/16/21 16:52*	*1*
Toluene-d8 (Surr)	*96*		*78 - 122*		*11/16/21 16:52*	*1*
Dibromofluoromethane (Surr)	*105*		*73 - 120*		*11/16/21 16:52*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159622-1

Client Sample ID: MW-117S_110521
Date Collected: 11/05/21 12:30
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159622-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/16/21 22:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*11/16/21 22:59*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 20:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 20:24	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 20:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 20:24	1
Trichloroethene	**0.52**	**J**	1.0	0.44	ug/L			11/16/21 20:24	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 20:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/16/21 20:24*	*1*
4-Bromofluorobenzene (Surr)	*93*		*56 - 136*		*11/16/21 20:24*	*1*
Toluene-d8 (Surr)	*99*		*78 - 122*		*11/16/21 20:24*	*1*
Dibromofluoromethane (Surr)	*118*		*73 - 120*		*11/16/21 20:24*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159815-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/26/2021 7:43:43 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159815-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159815-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159815-1

Comments
No additional comments.

Receipt
The samples were received on 11/11/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 4.6º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159815-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159815-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159815-1	TRIP BLANK_91	Water	11/09/21 00:00	11/11/21 08:00
240-159815-2	MW-151S_110921	Water	11/09/21 12:10	11/11/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159815-1

Client Sample ID: TRIP BLANK_91 — Lab Sample ID: 240-159815-1

No Detections.

Client Sample ID: MW-151S_110921 — Lab Sample ID: 240-159815-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	1.5		1.0	0.45	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159815-1

Client Sample ID: TRIP BLANK_91
Date Collected: 11/09/21 00:00
Date Received: 11/11/21 08:00

Lab Sample ID: 240-159815-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 17:21	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 17:21	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 17:21	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 17:21	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 17:21	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 17:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*121*		*62 - 137*		*11/19/21 17:21*	*1*
4-Bromofluorobenzene (Surr)	*67*		*56 - 136*		*11/19/21 17:21*	*1*
Toluene-d8 (Surr)	*85*		*78 - 122*		*11/19/21 17:21*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/19/21 17:21*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159815-1

Client Sample ID: MW-151S_110921
Date Collected: 11/09/21 12:10
Date Received: 11/11/21 08:00

Lab Sample ID: 240-159815-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 19:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*76*		*66 - 120*		*11/12/21 19:46*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 17:43	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 17:43	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 17:43	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 17:43	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 17:43	1
Vinyl chloride	**1.5**		1.0	0.45	ug/L			11/19/21 17:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*125*		*62 - 137*		*11/19/21 17:43*	*1*
4-Bromofluorobenzene (Surr)	*68*		*56 - 136*		*11/19/21 17:43*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/19/21 17:43*	*1*
Dibromofluoromethane (Surr)	*103*		*73 - 120*		*11/19/21 17:43*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159815-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159815-1	TRIP BLANK_91	121	67	85	100
240-159815-2	MW-151S_110921	125	68	89	103
LCS 240-513806/4	Lab Control Sample	98	94	104	84
MB 240-513806/7	Method Blank	112	76	91	92

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159541-G-2 MS	Matrix Spike	77
240-159541-M-2 MSD	Matrix Spike Duplicate	78
240-159815-2	MW-151S_110921	76
LCS 240-512785/4	Lab Control Sample	79
MB 240-512785/5	Method Blank	79

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513806/7
Matrix: Water
Analysis Batch: 513806

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 12:37	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 12:37	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 12:37	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 12:37	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 12:37	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 12:37	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*62 - 137*		*11/19/21 12:37*	*1*
4-Bromofluorobenzene (Surr)	*76*		*56 - 136*		*11/19/21 12:37*	*1*
Toluene-d8 (Surr)	*91*		*78 - 122*		*11/19/21 12:37*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*11/19/21 12:37*	*1*

Lab Sample ID: LCS 240-513806/4
Matrix: Water
Analysis Batch: 513806

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	7.99		ug/L		80	63 - 134
cis-1,2-Dichloroethene	10.0	9.65		ug/L		96	77 - 123
Tetrachloroethene	10.0	9.29		ug/L		93	76 - 123
trans-1,2-Dichloroethene	10.0	10.2		ug/L		102	75 - 124
Trichloroethene	10.0	8.38		ug/L		84	70 - 122
Vinyl chloride	10.0	8.94		ug/L		89	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*
Toluene-d8 (Surr)	*104*		*78 - 122*
Dibromofluoromethane (Surr)	*84*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512785/5
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 18:32	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*66 - 120*		*11/12/21 18:32*	*1*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-512785/4
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.7		ug/L		107	80 - 122		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*66 - 120*

Lab Sample ID: 240-159541-G-2 MS
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

Lab Sample ID: 240-159541-M-2 MSD
Matrix: Water
Analysis Batch: 512785

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.4		ug/L		104	51 - 153	2	16

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159815-1

GC/MS VOA

Analysis Batch: 512785

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159815-2	MW-151S_110921	Total/NA	Water	8260B SIM	
MB 240-512785/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512785/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159541-G-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159541-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513806

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159815-1	TRIP BLANK_91	Total/NA	Water	8260B	
240-159815-2	MW-151S_110921	Total/NA	Water	8260B	
MB 240-513806/7	Method Blank	Total/NA	Water	8260B	
LCS 240-513806/4	Lab Control Sample	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159815-1

Client Sample ID: TRIP BLANK_91

Lab Sample ID: 240-159815-1

Date Collected: 11/09/21 00:00

Matrix: Water

Date Received: 11/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513806	11/19/21 17:21	LEE	TAL CAN

Client Sample ID: MW-151S_110921

Lab Sample ID: 240-159815-2

Date Collected: 11/09/21 12:10

Matrix: Water

Date Received: 11/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513806	11/19/21 17:43	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512785	11/12/21 19:46	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159815-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No: 1 of 1 COCs
Phone: 248-994-2240	Sampler Name: Sommer Gray	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day (10 day)	For lab use only: Walk-in client; Lab sampling; Job/SDG No:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30080642.402.04	Shipping/Tracking No:		
PO # 30080642.402.04			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_91	—	—		X						1							X	X	X	X	X	X	X	1 Trip Blank
MW-151S_110921	11/9/21	12:10		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159815 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal ByLab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company:	Date/Time:		Company:	Date/Time:
Relinquished by: Sommer Gray	Arcadis	11/9/21 15:00	Received by: Novi Cold Storage	Arcadis	11/9/21 15:00
Relinquished by: Julia McClafferty	Arcadis	11/10/21	Received by:	GSO	11/10/21 1032
Relinquished by:	GSO	11/10/21 1045	Received in Laboratory by: Tammy Boyer	ETA	11-11-21 800

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11/26/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 159815
Canton Facility

Client Arcadis Site Name

Cooler unpacked by: Tammy Depp

Cooler Received on 11-11-21 Opened on 11-11-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # 1A Foam Box Client Cooler Box Other

Packing material used: ~~Bubble Wrap~~ Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 4.5 °C Corrected Cooler Temp. 4.6 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?	(Y/N)	(Y/N)
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# HC157842
14. Were VOAs on the COC?	(Yes)	~~No~~
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 60358	(Yes)	~~No~~
17. Was a LL Hg or Me Hg trip blank present?	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

No SIM on TB per Corrected COC. Jove 11/11/21

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

November 26, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159815-1
Sample date: 2021-11-09
Report received by CADENA: 2021-11-26
Initial Data Verification completed by CADENA: 2021-11-26
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159815-1

		Sample Name:	TRIP BLANK_91				MW-151S_110921			
		Lab Sample ID:	2401598151				2401598152			
		Sample Date:	11/9/2021				11/9/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	1.5	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

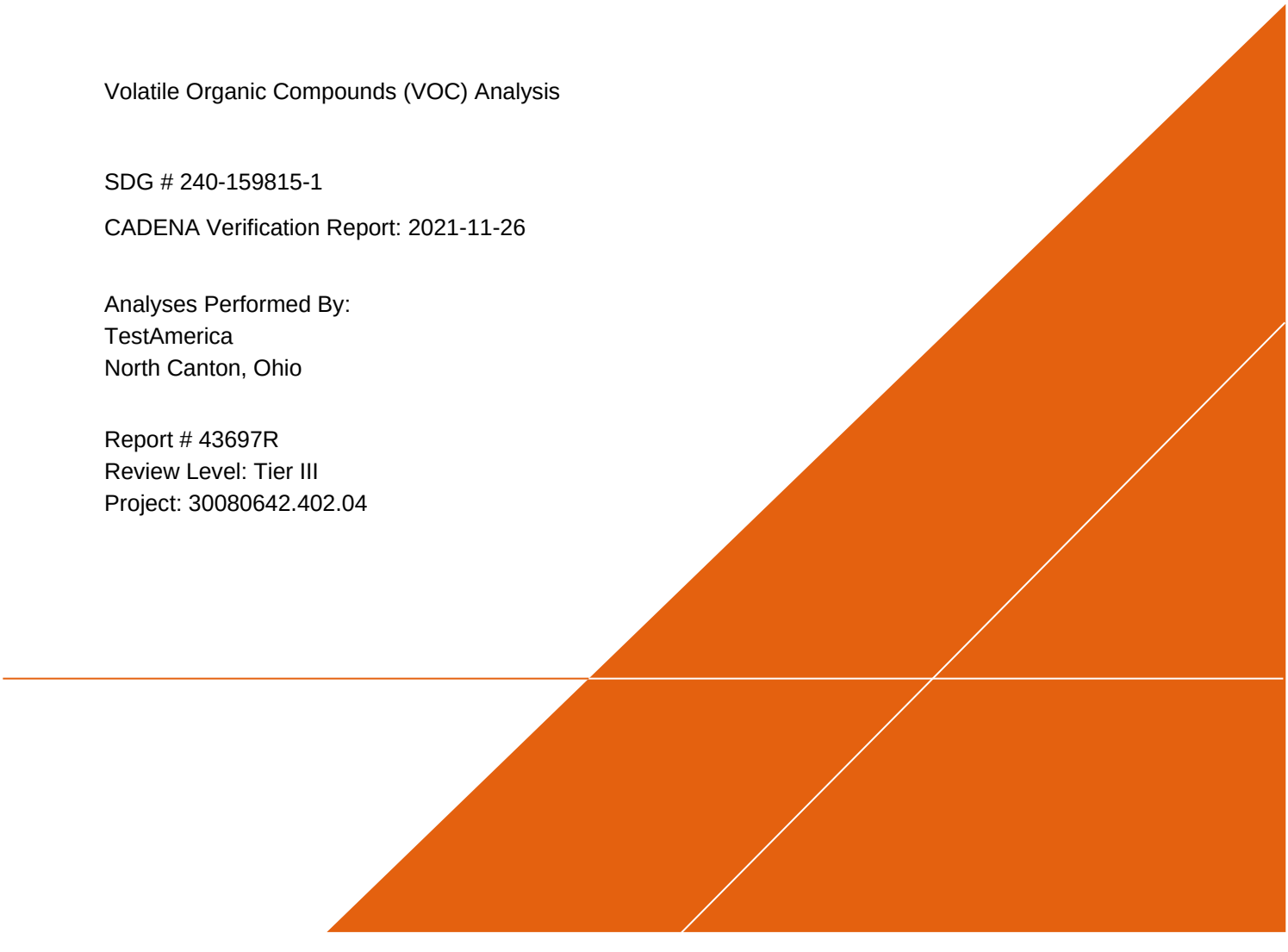
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159815-1

CADENA Verification Report: 2021-11-26

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43697R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159815-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_91	240-159815-1	Water	11/09/21		X	
MW-151S_110921	240-159815-2	Water	11/09/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 13, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Sommer Guy	TAT if different from below: 10 day; ☑ 2 weeks; ☐ 3 weeks; ☐ 1 week; ☐ 2 days; ☐ 1 day		Walk-in client:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling:
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAr/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_91	—	—		X						1							X	X	X	X	X	X	X	1 Trip Blank
MW-151S_110921	11/9/21	12:10		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159815 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal ByLab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by: Sommer Guy	Company: Arcadis	Date/Time: 11/9/21 15:00	Received by: Novi Cold Storage	Company: Arcadis	Date/Time: 11/9/21 15:00
Relinquished by:	Company: Arcadis	Date/Time: 11/10/21	Received by:	Company: ETA	Date/Time: 11/10/21 1032
Relinquished by:	Company: ETA	Date/Time: 11/10/21 1040	Received in Laboratory by:	Company: ETA	Date/Time: 11-11-21 800

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11/26/2021

Client Sample ID: TRIP BLANK_91
Lab Sample ID: 240-159815-1
Date Collected: 11/09/21 00:00
Matrix: Water
Date Received: 11/11/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 17:21	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 17:21	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 17:21	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 17:21	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 17:21	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 17:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*121*		*62 - 137*		*11/19/21 17:21*	*1*
4-Bromofluorobenzene (Surr)	*67*		*56 - 136*		*11/19/21 17:21*	*1*
Toluene-d8 (Surr)	*85*		*78 - 122*		*11/19/21 17:21*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/19/21 17:21*	*1*

Client Sample ID: MW-151S_110921
Lab Sample ID: 240-159815-2
Date Collected: 11/09/21 12:10
Matrix: Water
Date Received: 11/11/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 19:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*76*		*66 - 120*		*11/12/21 19:46*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 17:43	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 17:43	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 17:43	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 17:43	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 17:43	1
Vinyl chloride	**1.5**		1.0	0.45	ug/L			11/19/21 17:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*125*		*62 - 137*		*11/19/21 17:43*	*1*
4-Bromofluorobenzene (Surr)	*68*		*56 - 136*		*11/19/21 17:43*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/19/21 17:43*	*1*
Dibromofluoromethane (Surr)	*103*		*73 - 120*		*11/19/21 17:43*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159708-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/24/2021 8:20:17 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159708-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
E	Result exceeded calibration range.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159708-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159708-1

Comments
No additional comments.

Receipt
The samples were received on 11/10/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 0.7º C and 0.8º C.

GC/MS VOA
Method 8260B: The MSD for batch 513414 is outside of QC tune time but is reported: (240-159610-C-1 MSD).

Method 8260B: The laboratory control sample (LCS) for 513414 recovered outside control limits for multiple analytes. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159708-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159708-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159708-1	TRIP BLANK_46	Water	11/05/21 00:00	11/10/21 08:00
240-159708-2	MW-156S_110521	Water	11/05/21 13:16	11/10/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159708-1

Client Sample ID: TRIP BLANK_46 — Lab Sample ID: 240-159708-1

No Detections.

Client Sample ID: MW-156S_110521 — Lab Sample ID: 240-159708-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159708-1

Client Sample ID: TRIP BLANK_46

Date Collected: 11/05/21 00:00
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159708-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 15:55	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 15:55	1
Tetrachloroethene	1.0	U *+	1.0	0.44	ug/L			11/17/21 15:55	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 15:55	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 15:55	1
Vinyl chloride	1.0	U *+	1.0	0.45	ug/L			11/17/21 15:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*		*11/17/21 15:55*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/17/21 15:55*	*1*
Toluene-d8 (Surr)	*114*		*78 - 122*		*11/17/21 15:55*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/17/21 15:55*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159708-1

Client Sample ID: MW-156S_110521
Date Collected: 11/05/21 13:16
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159708-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 00:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*76*		*66 - 120*		*11/18/21 00:18*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 16:17	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 16:17	1
Tetrachloroethene	1.0	U *+	1.0	0.44	ug/L			11/17/21 16:17	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 16:17	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 16:17	1
Vinyl chloride	1.0	U *+	1.0	0.45	ug/L			11/17/21 16:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*62 - 137*		*11/17/21 16:17*	*1*
4-Bromofluorobenzene (Surr)	*77*		*56 - 136*		*11/17/21 16:17*	*1*
Toluene-d8 (Surr)	*102*		*78 - 122*		*11/17/21 16:17*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*11/17/21 16:17*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159708-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159610-C-1 MS	Matrix Spike	100	90	114	97
240-159610-C-1 MSD	Matrix Spike Duplicate	96	86	108	92
240-159708-1	TRIP BLANK_46	98	81	114	98
240-159708-2	MW-156S_110521	94	77	102	92
LCS 240-513414/4	Lab Control Sample	98	93	119	99
MB 240-513414/6	Method Blank	92	75	103	91

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159636-H-2 MS	Matrix Spike	77
240-159636-N-2 MSD	Matrix Spike Duplicate	77
240-159708-2	MW-156S_110521	76
LCS 240-513479/4	Lab Control Sample	78
MB 240-513479/5	Method Blank	77

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513414/6
Matrix: Water
Analysis Batch: 513414

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 13:40	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 13:40	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 13:40	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 13:40	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 13:40	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 13:40	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/17/21 13:40*	*1*
4-Bromofluorobenzene (Surr)	*75*		*56 - 136*		*11/17/21 13:40*	*1*
Toluene-d8 (Surr)	*103*		*78 - 122*		*11/17/21 13:40*	*1*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*11/17/21 13:40*	*1*

Lab Sample ID: LCS 240-513414/4
Matrix: Water
Analysis Batch: 513414

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	12.1		ug/L		121	63 - 134
cis-1,2-Dichloroethene	10.0	11.7		ug/L		117	77 - 123
Tetrachloroethene	10.0	13.3	*+	ug/L		133	76 - 123
trans-1,2-Dichloroethene	10.0	11.9		ug/L		119	75 - 124
Trichloroethene	10.0	10.3		ug/L		103	70 - 122
Vinyl chloride	10.0	14.5	*+	ug/L		145	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*
4-Bromofluorobenzene (Surr)	*93*		*56 - 136*
Toluene-d8 (Surr)	*119*		*78 - 122*
Dibromofluoromethane (Surr)	*99*		*73 - 120*

Lab Sample ID: 240-159610-C-1 MS
Matrix: Water
Analysis Batch: 513414

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	6400		3330	9810		ug/L		103	56 - 135
cis-1,2-Dichloroethene	6900		3330	10800		ug/L		115	66 - 128
Tetrachloroethene	16000	E *+	3330	18200	E 4	ug/L		55	62 - 131
trans-1,2-Dichloroethene	330	U	3330	3900		ug/L		117	56 - 136
Trichloroethene	2600		3330	5610		ug/L		92	61 - 124
Vinyl chloride	190	J *+	3330	5040		ug/L		146	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*90*		*56 - 136*
Toluene-d8 (Surr)	*114*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159610-C-1 MS
Matrix: Water
Analysis Batch: 513414

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*97*		*73 - 120*

Lab Sample ID: 240-159610-C-1 MSD
Matrix: Water
Analysis Batch: 513414

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	6400		3330	8970		ug/L		78	56 - 135	9	26
cis-1,2-Dichloroethene	6900		3330	9820		ug/L		87	66 - 128	9	14
Tetrachloroethene	16000	E *+	3330	16800	E 4	ug/L		13	62 - 131	8	20
trans-1,2-Dichloroethene	330	U	3330	3420		ug/L		103	56 - 136	13	15
Trichloroethene	2600		3330	5290		ug/L		82	61 - 124	6	15
Vinyl chloride	190	J *+	3330	4530		ug/L		130	43 - 157	11	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*
4-Bromofluorobenzene (Surr)	*86*		*56 - 136*
Toluene-d8 (Surr)	*108*		*78 - 122*
Dibromofluoromethane (Surr)	*92*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513479/5
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 17:41	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*		*11/17/21 17:41*	*1*

Lab Sample ID: LCS 240-513479/4
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane			10.0	11.9		ug/L		119	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*78*		*66 - 120*

Lab Sample ID: 240-159636-H-2 MS
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

Lab Sample ID: 240-159636-N-2 MSD
Matrix: Water
Analysis Batch: 513479

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153	0	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159708-1

GC/MS VOA

Analysis Batch: 513414

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159708-1	TRIP BLANK_46	Total/NA	Water	8260B	
240-159708-2	MW-156S_110521	Total/NA	Water	8260B	
MB 240-513414/6	Method Blank	Total/NA	Water	8260B	
LCS 240-513414/4	Lab Control Sample	Total/NA	Water	8260B	
240-159610-C-1 MS	Matrix Spike	Total/NA	Water	8260B	
240-159610-C-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 513479

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159708-2	MW-156S_110521	Total/NA	Water	8260B SIM	
MB 240-513479/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513479/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159636-H-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159636-N-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159708-1

Client Sample ID: TRIP BLANK_46

Lab Sample ID: 240-159708-1

Date Collected: 11/05/21 00:00

Matrix: Water

Date Received: 11/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513414	11/17/21 15:55	LEE	TAL CAN

Client Sample ID: MW-156S_110521

Lab Sample ID: 240-159708-2

Date Collected: 11/05/21 13:16

Matrix: Water

Date Received: 11/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513414	11/17/21 16:17	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513479	11/18/21 00:18	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159708-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN
190

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Gary Schafer		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30080642.402.04	Shipping/Tracking No:		
PO # 30080642.402.04			

COC No:

1 of 1 COCs

For lab use only
Walk-in client
Lab sampling
Job/SDG No:

Analysis Turnaround Time
TAT if different from below
10 day
☐ 3 weeks
☑ 2 weeks
☐ 1 week
☐ 2 days
☐ 1 day

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM					Sample Specific Notes / Special Instructions:
TRIP BLANK_ 46	---	---		X						1					N	G	X	X	X	X	X	X	~~X~~					1 Trip Blank
MW-1565-110521	11/05/21	13:16		X						6					N	G	X	X	X	X	X	X	X					3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159708 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	11/08/21 1621	Novi Cold Storage	Arcadis	11/08/21 1621
[signature]	ARCADIS	11/9/21 / 1040	Jeri Hall	ETA	11/9/21 1040
Jeri Hall	ETA	11/9/21 1055	Mandolyn Bloch	exn	11-10-21 8:00

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** _____
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Mandolyn Beer

Cooler Received on 11-10-21 Opened on 11-10-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: ~~Bubble Wrap~~ Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity_____	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC157842
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #_____	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

NO SIM on TB via corrected COC

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

Login # : _____

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form				
Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
TA Client Box Other	IR-14 IR-15	0-6	0-7	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15	0-7	0-8	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15	

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 240-159708-1

Login Number: 159708
List Number: 1
Creator: Snyder, Matthew

List Source: Eurofins TestAmerica, Canton

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.		
The cooler's custody seal, if present, is intact.		
Sample custody seals, if present, are intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the containers received and the COC.		
Samples are received within Holding Time (excluding tests with immediate HTs)		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified.		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Residual Chlorine Checked.		

DATA VERIFICATION REPORT

November 25, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159708-1
Sample date: 2021-11-05
Report received by CADENA: 2021-11-24
Initial Data Verification completed by CADENA: 2021-11-25
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

MS/MSD recovery outliers or sample duplicate RPD outliers were not determined using a client sample from this submittal for the test and QC batch noted so qualification was not required based on these sample-specific QC outliers:
GCMS VOC QC batch 513414.

LCS recoveries were outliers biased HIGH for these tests and analytes (or one LCS and the associated LCS/LCSD RPD). All associated client sample results were non-detect for these analytes so were not affected by the high bias and qualification was not required:
GCMS VOC QC batch 51314 - tetrachloroethylene, vinyl chloride.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159708-1

		Sample Name:	TRIP BLANK_46				MW-156S_110521			
		Lab Sample ID:	2401597081				2401597082			
		Sample Date:	11/5/2021				11/5/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

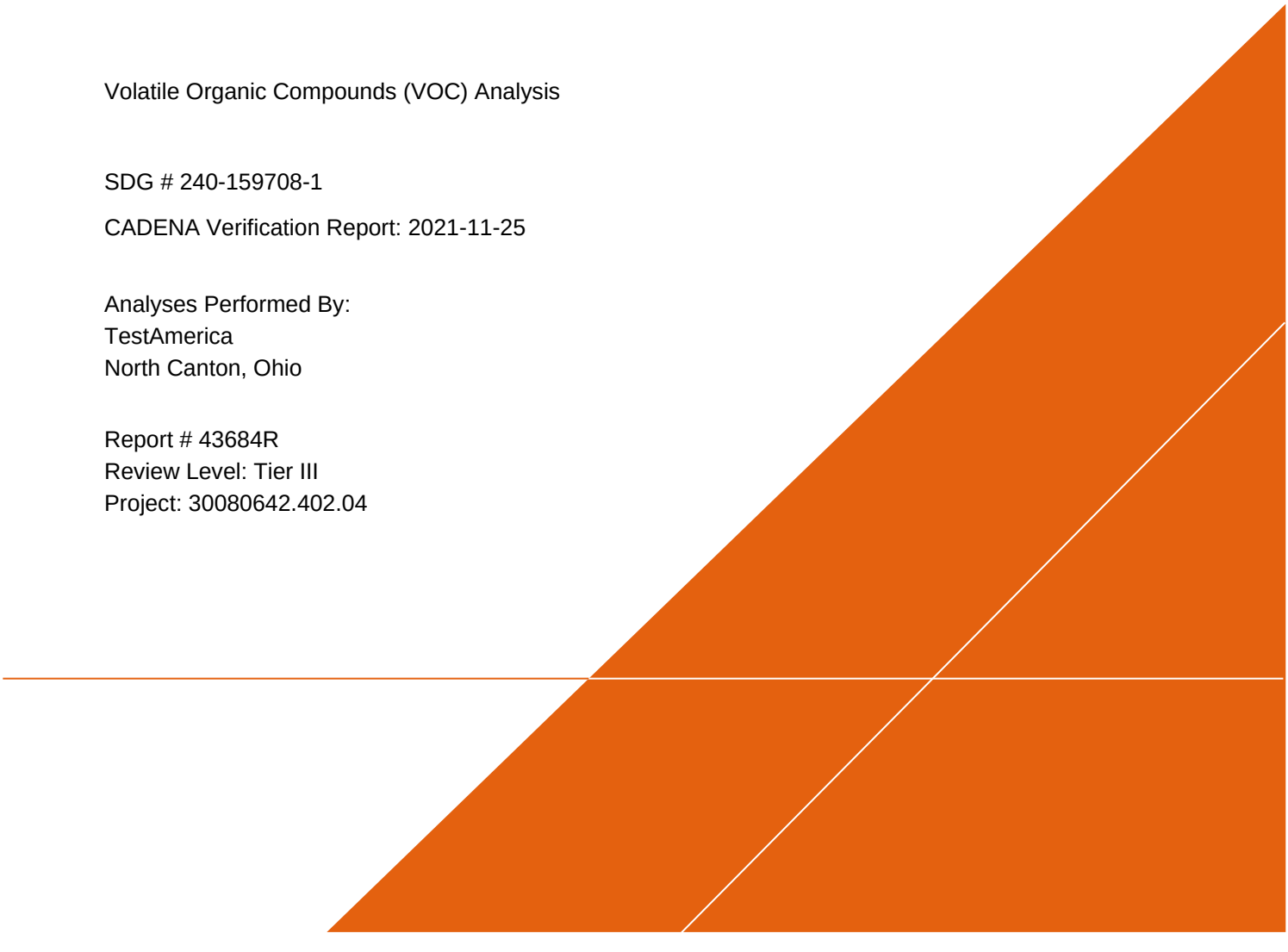
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159708-1

CADENA Verification Report: 2021-11-25

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43684R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159708-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_46	240-159708-1	Water	11/05/21		X	
MW-156S_110521	240-159708-2	Water	11/05/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 10, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 14, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN
190

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Gary Schafer		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30080642.402.04	Shipping/Tracking No:		
PO # 30080642.402.04			

COC No:

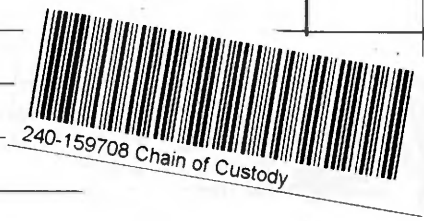
1 of 1 COCs

For lab use only
Walk-in client
Lab sampling
Job/SDG No:

Analysis Turnaround Time
TAT if different from below
10 day
☐ 3 weeks
☑ 2 weeks
☐ 1 week
☐ 2 days
☐ 1 day

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM					Sample Specific Notes / Special Instructions:
TRIP BLANK_ 46	---	---		X						1					N	G	X	X	X	X	X	X	~~X~~ SW					1 Trip Blank
MW-1565-110521	11/05/21	13:16		X						6					N	G	X	X	X	X	X	X	X					3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159708 Chain of Custody



Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	11/08/21 1621	Novi Cold Storage	Arcadis	11/08/21 1621
[signature]	ARCADIS	11/9/21 / 1040	[signature]	ETA	11/9/21 1040
[signature]	ETA	11/9/21 1055	Mandolyn Bloch	ETA	11-10-21 8:00

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Client Sample ID: TRIP BLANK_46
Lab Sample ID: 240-159708-1
Date Collected: 11/05/21 00:00
Matrix: Water
Date Received: 11/10/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 15:55	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 15:55	1
Tetrachloroethene	1.0	U *+	1.0	0.44	ug/L			11/17/21 15:55	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 15:55	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 15:55	1
Vinyl chloride	1.0	U *+	1.0	0.45	ug/L			11/17/21 15:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*		*11/17/21 15:55*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/17/21 15:55*	*1*
Toluene-d8 (Surr)	*114*		*78 - 122*		*11/17/21 15:55*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/17/21 15:55*	*1*

Client Sample ID: MW-156S_110521
Lab Sample ID: 240-159708-2
Date Collected: 11/05/21 13:16
Matrix: Water
Date Received: 11/10/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 00:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*76*		*66 - 120*		*11/18/21 00:18*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 16:17	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 16:17	1
Tetrachloroethene	1.0	U *+	1.0	0.44	ug/L			11/17/21 16:17	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 16:17	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 16:17	1
Vinyl chloride	1.0	U *+	1.0	0.45	ug/L			11/17/21 16:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*62 - 137*		*11/17/21 16:17*	*1*
4-Bromofluorobenzene (Surr)	*77*		*56 - 136*		*11/17/21 16:17*	*1*
Toluene-d8 (Surr)	*102*		*78 - 122*		*11/17/21 16:17*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*11/17/21 16:17*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-160151-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
12/3/2021 3:45:03 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at:
www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160151-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F2	MS/MSD RPD exceeds control limits
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-160151-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-160151-1

Comments
No additional comments.

Receipt
The samples were received on 11/16/2021 10:15 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.9° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160151-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160151-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-160151-1	TRIP BLANK_126	Water	11/12/21 00:00	11/16/21 10:15
240-160151-2	MW-145S_111221	Water	11/12/21 11:50	11/16/21 10:15

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160151-1

Client Sample ID: TRIP BLANK_126 — Lab Sample ID: 240-160151-1

No Detections.

Client Sample ID: MW-145S_111221 — Lab Sample ID: 240-160151-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160151-1

Client Sample ID: TRIP BLANK_126
Date Collected: 11/12/21 00:00
Date Received: 11/16/21 10:15

Lab Sample ID: 240-160151-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 05:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 05:50	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 05:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 05:50	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 05:50	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 05:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/20/21 05:50*	*1*
4-Bromofluorobenzene (Surr)	*74*		*56 - 136*		*11/20/21 05:50*	*1*
Toluene-d8 (Surr)	*106*		*78 - 122*		*11/20/21 05:50*	*1*
Dibromofluoromethane (Surr)	*93*		*73 - 120*		*11/20/21 05:50*	*1*

Client Sample ID: MW-145S_111221
Date Collected: 11/12/21 11:50
Date Received: 11/16/21 10:15

Lab Sample ID: 240-160151-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/19/21 02:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*74*		*66 - 120*		*11/19/21 02:44*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 06:12	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 06:12	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 06:12	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 06:12	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 06:12	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 06:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/20/21 06:12*	*1*
4-Bromofluorobenzene (Surr)	*74*		*56 - 136*		*11/20/21 06:12*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/20/21 06:12*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/20/21 06:12*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160151-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-160150-B-2 MS	Matrix Spike	99	85	110	90
240-160150-D-2 MSD	Matrix Spike Duplicate	104	88	122	96
240-160151-1	TRIP BLANK_126	99	74	106	93
240-160151-2	MW-145S_111221	105	74	108	99
LCS 240-513905/4	Lab Control Sample	104	89	118	97
MB 240-513905/6	Method Blank	99	73	109	92

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159739-G-3 MS	Matrix Spike	74
240-159739-M-3 MSD	Matrix Spike Duplicate	75
240-160151-2	MW-145S_111221	74
LCS 240-513700/4	Lab Control Sample	75
MB 240-513700/5	Method Blank	77

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513905/6
Matrix: Water
Analysis Batch: 513905

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 03:58	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 03:58	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 03:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 03:58	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 03:58	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 03:58	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/20/21 03:58*	*1*
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*11/20/21 03:58*	*1*
Toluene-d8 (Surr)	*109*		*78 - 122*		*11/20/21 03:58*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*11/20/21 03:58*	*1*

Lab Sample ID: LCS 240-513905/4
Matrix: Water
Analysis Batch: 513905

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.9		ug/L		109	63 - 134
cis-1,2-Dichloroethene	10.0	10.4		ug/L		104	77 - 123
Tetrachloroethene	10.0	10.3		ug/L		103	76 - 123
trans-1,2-Dichloroethene	10.0	10.6		ug/L		106	75 - 124
Trichloroethene	10.0	8.96		ug/L		90	70 - 122
Vinyl chloride	10.0	11.0		ug/L		110	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*104*		*62 - 137*
4-Bromofluorobenzene (Surr)	*89*		*56 - 136*
Toluene-d8 (Surr)	*118*		*78 - 122*
Dibromofluoromethane (Surr)	*97*		*73 - 120*

Lab Sample ID: 240-160150-B-2 MS
Matrix: Water
Analysis Batch: 513905

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	7.96		ug/L		80	56 - 135
cis-1,2-Dichloroethene	1.0	U F2	10.0	8.59		ug/L		86	66 - 128
Tetrachloroethene	1.0	U	10.0	7.18		ug/L		72	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	8.27		ug/L		83	56 - 136
Trichloroethene	1.0	U	10.0	6.70		ug/L		67	61 - 124
Vinyl chloride	1.0	U	10.0	8.91		ug/L		89	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*
Toluene-d8 (Surr)	*110*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-160150-B-2 MS
Matrix: Water
Analysis Batch: 513905

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*90*		*73 - 120*

Lab Sample ID: 240-160150-D-2 MSD
Matrix: Water
Analysis Batch: 513905

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.12		ug/L		91	56 - 135	14	26
cis-1,2-Dichloroethene	1.0	U F2	10.0	10.1	F2	ug/L		101	66 - 128	16	14
Tetrachloroethene	1.0	U	10.0	8.59		ug/L		86	62 - 131	18	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.32		ug/L		93	56 - 136	12	15
Trichloroethene	1.0	U	10.0	7.73		ug/L		77	61 - 124	14	15
Vinyl chloride	1.0	U	10.0	9.29		ug/L		93	43 - 157	4	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*104*		*62 - 137*
4-Bromofluorobenzene (Surr)	*88*		*56 - 136*
Toluene-d8 (Surr)	*122*		*78 - 122*
Dibromofluoromethane (Surr)	*96*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513700/5
Matrix: Water
Analysis Batch: 513700

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 19:41	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*77*		*66 - 120*		*11/18/21 19:41*	*1*

Lab Sample ID: LCS 240-513700/4
Matrix: Water
Analysis Batch: 513700

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.4		ug/L		104	80 - 122		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*

Lab Sample ID: 240-159739-G-3 MS
Matrix: Water
Analysis Batch: 513700

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U F1	10.0	10.4		ug/L		104	51 - 153		

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*74*		*66 - 120*

Lab Sample ID: 240-159739-M-3 MSD
Matrix: Water
Analysis Batch: 513700

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.6		ug/L		106	51 - 153	2	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*75*		*66 - 120*

GC/MS VOA

Analysis Batch: 513700

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-160151-2	MW-145S_111221	Total/NA	Water	8260B SIM	
MB 240-513700/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513700/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159739-G-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159739-M-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513905

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-160151-1	TRIP BLANK_126	Total/NA	Water	8260B	
240-160151-2	MW-145S_111221	Total/NA	Water	8260B	
MB 240-513905/6	Method Blank	Total/NA	Water	8260B	
LCS 240-513905/4	Lab Control Sample	Total/NA	Water	8260B	
240-160150-B-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-160150-D-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160151-1

Client Sample ID: TRIP BLANK_126

Lab Sample ID: 240-160151-1

Date Collected: 11/12/21 00:00

Matrix: Water

Date Received: 11/16/21 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513905	11/20/21 05:50	LEE	TAL CAN

Client Sample ID: MW-145S_111221

Lab Sample ID: 240-160151-2

Date Collected: 11/12/21 11:50

Matrix: Water

Date Received: 11/16/21 10:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513905	11/20/21 06:12	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513700	11/19/21 02:44	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-160151-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton – 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: John McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-444-6131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Sara Hundley / CHRISTINE WINTERER	TAT if different from below: 10 day ✓ 2 weeks; 1 week; 2 days; 1 day; 3 weeks		Walk-in client: Lab sampling: Job/SDG No:
Phone: 248-994-2240	Method of Shipment/Carrier:			
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: HCl	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_1216	—	—		X				1	N	C	X	X	X	X	X	X	X	1 Trip Blank
MW-145S_111221	11/12/21	11 50		G				6	N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-160151 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; ✓ Disposal By Lab; Archive For: Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at itamalis@cadenaco.com. Cadena #E203631
Level IV Reporting requested

Relinquished by:	Company:	Date/Time:	Received by:	Company	Date/Time:
	Arcadis	11/12/21 1915		Arcadis	11/18/21 0815
Relinquished by:	Company:	Date/Time:	Received by:	Company	Date/Time:
	Arcadis	11/19/21		ETA	11/15/21
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
	ETA	11/15/21		ETA	11-16-21 1015

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 160151
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: [signature]

Cooler Received on 11-16-21 Opened on 11-16-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT. Wet Ice Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.8 °C Corrected Cooler Temp. 0.9 °C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2 Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No

-Were the seals on the outside of the cooler(s) signed & dated? Yes No NA

-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No

-Were tamper/custody seals intact and uncompromised? Yes No NA

3 Shippers' packing slip attached to the cooler(s)? Yes No

4 Did custody papers accompany the sample(s)? Yes No

5. Were the custody papers relinquished & signed in the appropriate place? Yes No

6 Was/were the person(s) who collected the samples clearly identified on the COC? Yes No

7 Did all bottles arrive in good condition (Unbroken)? Yes No

8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes No

9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)? TB

10. Were correct bottle(s) used for the test(s) indicated? Yes No

11. Sufficient quantity received to perform indicated analyses? Yes No

12. Are these work share samples and all listed on the COC? Yes No

If yes, Questions 13-17 have been checked at the originating laboratory.

13. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# **HC157842**

14. Were VOAs on the COC? Yes No

15 Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this Yes No NA

16 Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 60358 Yes No

17. Was a LL Hg or Me Hg trip blank present? _____ Yes No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page Samples processed by:

no SIM on TB per corrected COC. [initials] 11/16/21

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired

Sample(s) _____ were received in a broken container

Sample(s) _____ were received with bubble >6 mm in diameter (Notify PM)

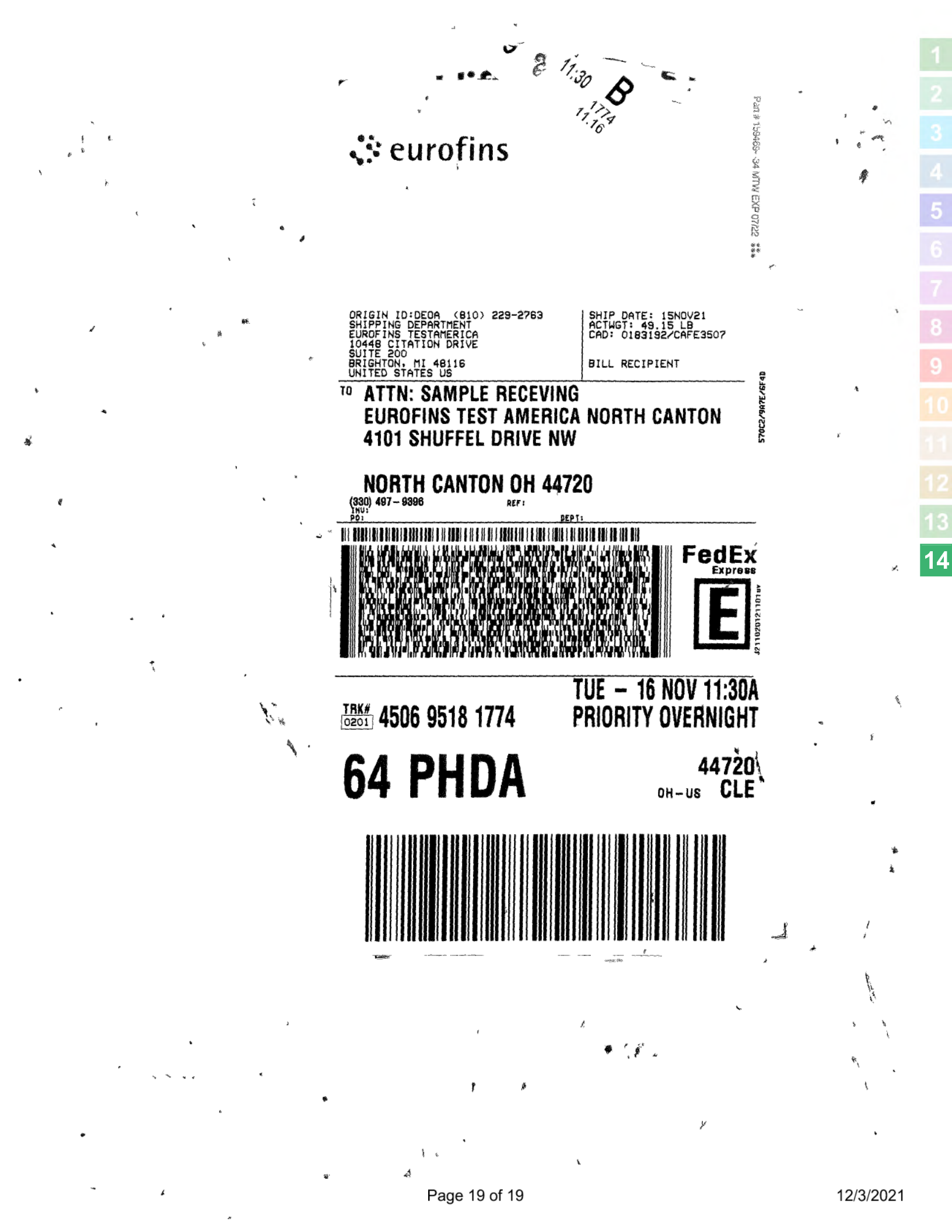
20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory

Time preserved _____ Preservative(s) added/Lot number(s). _____

VOA Sample Preservation - Date/Time VOAs Frozen _____

WI-NC-099


eurofins
11:30
B
1774
11.16
Part # 159469- 34 MTW EXP 07/22
ORIGIN ID:DEOA (810) 229-2763
SHIPPING DEPARTMENT
EUROFINS TESTAMERICA
10448 CITATION DRIVE
SUITE 200
BRIGHTON, MI 48116
UNITED STATES US
SHIP DATE: 15NOV21
ACTWGT: 49.15 LB
CAD: 0183192/CAFE3507
BILL RECIPIENT
TO ATTN: SAMPLE RECEVING
EUROFINS TEST AMERICA NORTH CANTON
4101 SHUFFEL DRIVE NW
NORTH CANTON OH 44720
(330) 497-9396
INV:
PO:
REF:
DEPT:
570C2/9B7E/6F4D
FedEx
Express
TUE - 16 NOV 11:30A
PRIORITY OVERNIGHT
TRK# 0201 4506 9518 1774
64 PHDA
44720
OH-US CLE

DATA VERIFICATION REPORT

December 04, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 160151-1
Sample date: 2021-11-12
Report received by CADENA: 2021-12-03
Initial Data Verification completed by CADENA: 2021-12-04
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch MS/MSD recovery outliers were not determined using a client sample so qualification was not required based on these sample-specific QC outliers.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 160151-1

		Sample Name:	TRIP BLANK_126				MW-145S_111221			
		Lab Sample ID:	2401601511				2401601512			
		Sample Date:	11/12/2021				11/12/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

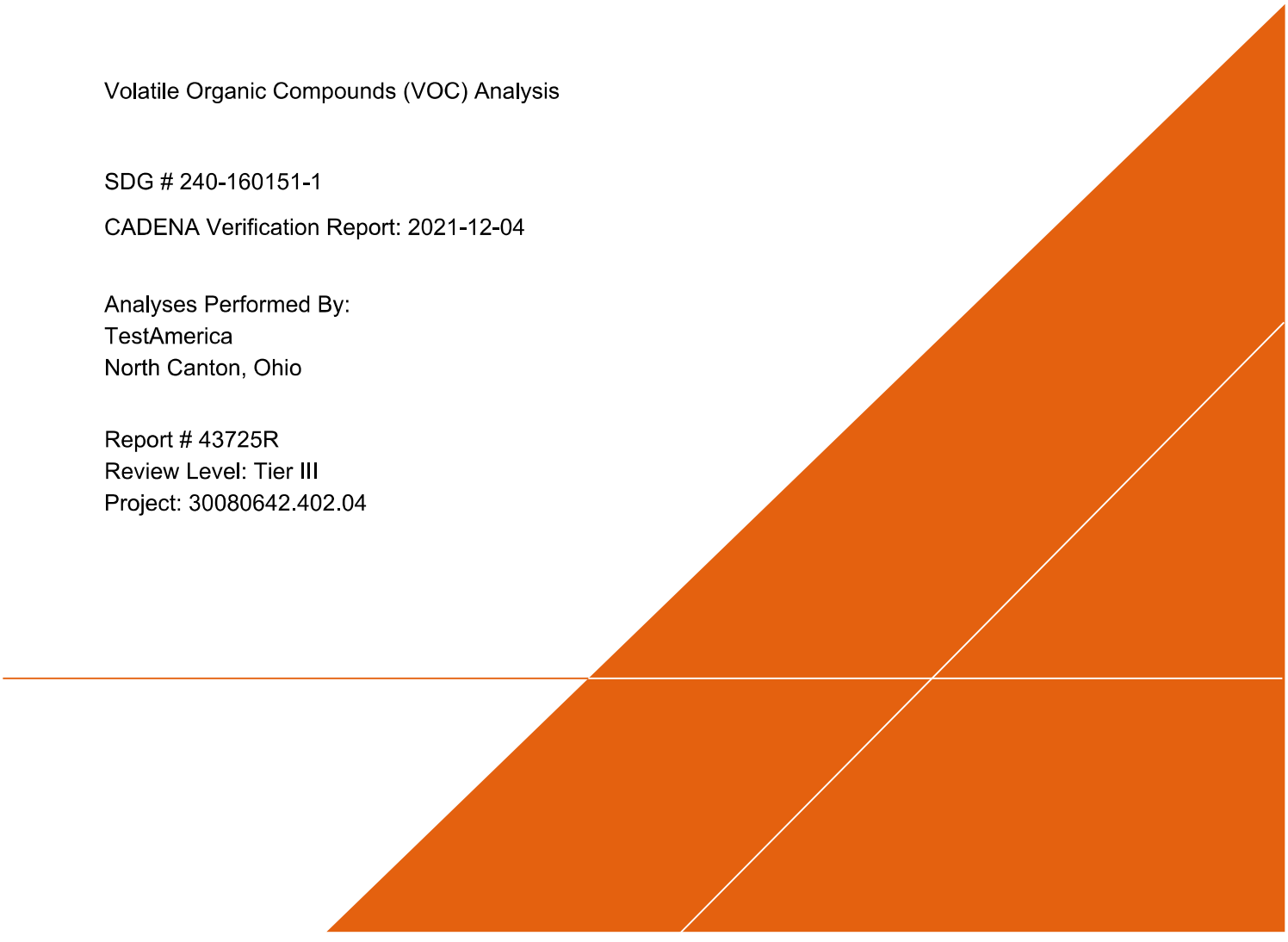
Volatile Organic Compounds (VOC) Analysis

SDG # 240-160151-1

CADENA Verification Report: 2021-12-04

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43725R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-160151-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_126	240-160151-1	Water	11/12/21		X	
MW-145S_111221	240-160151-2	Water	11/12/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Sam Hundley / COURIER CHRISTINA WEAVER	TAT if different from below: 10 day ✓ 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8280B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_126	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-145S_111221	11/12/21	11 50		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-160151 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ✓ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested

	Company	Date/Time		Company	Date/Time
Relinquished by: SH	Arcadis	11/12/21 15 15	Received by: Novi cooler storage	Arcadis	11/12/21 15 15
Relinquished by:	Arcadis	11/15/21	Received by:	ETA	11/15/21
Relinquished by:	ETA	11/15/21	Received in Laboratory by:	ETA	11-16-21 1015

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Client Sample ID: TRIP BLANK_126
Lab Sample ID: 240-160151-1

Date Collected: 11/12/21 00:00
Matrix: Water
Date Received: 11/16/21 10:15

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 05:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 05:50	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 05:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 05:50	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 05:50	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 05:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/20/21 05:50*	*1*
4-Bromofluorobenzene (Surr)	*74*		*56 - 136*		*11/20/21 05:50*	*1*
Toluene-d8 (Surr)	*106*		*78 - 122*		*11/20/21 05:50*	*1*
Dibromofluoromethane (Surr)	*93*		*73 - 120*		*11/20/21 05:50*	*1*

Client Sample ID: MW-145S_111221
Lab Sample ID: 240-160151-2

Date Collected: 11/12/21 11:50
Matrix: Water
Date Received: 11/16/21 10:15

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/19/21 02:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*74*		*66 - 120*		*11/19/21 02:44*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/20/21 06:12	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/20/21 06:12	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 06:12	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/20/21 06:12	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/20/21 06:12	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/20/21 06:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/20/21 06:12*	*1*
4-Bromofluorobenzene (Surr)	*74*		*56 - 136*		*11/20/21 06:12*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/20/21 06:12*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/20/21 06:12*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159966-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/29/2021 8:45:41 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159966-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159966-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159966-1

Comments
No additional comments.

Receipt
The samples were received on 11/12/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.6º C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) associated with batch 513804 recovered above the upper control limit for Vinyl Chloride. The samples associated with this CCV were non-detect for the affected analyte; therefore, the data have been reported. The associated samples are impacted: TRIP BLANK_117 (240-159966-1) and MW-94S_111021 (240-159966-2).

Method 8260B: The laboratory control sample (LCS) for 513804 recovered outside control limits for Tetrachloroethene. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159966-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159966-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159966-1	TRIP BLANK_117	Water	11/10/21 00:00	11/12/21 08:00
240-159966-2	MW-94S_111021	Water	11/10/21 16:31	11/12/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159966-1

Client Sample ID: TRIP BLANK_117 — Lab Sample ID: 240-159966-1

No Detections.

Client Sample ID: MW-94S_111021 — Lab Sample ID: 240-159966-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159966-1

Client Sample ID: TRIP BLANK_117
Date Collected: 11/10/21 00:00
Date Received: 11/12/21 08:00

Lab Sample ID: 240-159966-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 23:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 23:07	1
Tetrachloroethene	1.0	U *+	1.0	0.44	ug/L			11/19/21 23:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 23:07	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 23:07	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 23:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*62 - 137*		*11/19/21 23:07*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/19/21 23:07*	*1*
Toluene-d8 (Surr)	*102*		*78 - 122*		*11/19/21 23:07*	*1*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*11/19/21 23:07*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159966-1

Client Sample ID: MW-94S_111021
Date Collected: 11/10/21 16:31
Date Received: 11/12/21 08:00

Lab Sample ID: 240-159966-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 05:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*		*11/18/21 05:56*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 23:29	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 23:29	1
Tetrachloroethene	1.0	U *+	1.0	0.44	ug/L			11/19/21 23:29	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 23:29	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 23:29	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 23:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*62 - 137*		*11/19/21 23:29*	*1*
4-Bromofluorobenzene (Surr)	*75*		*56 - 136*		*11/19/21 23:29*	*1*
Toluene-d8 (Surr)	*115*		*78 - 122*		*11/19/21 23:29*	*1*
Dibromofluoromethane (Surr)	*103*		*73 - 120*		*11/19/21 23:29*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159966-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159953-A-2 MS	Matrix Spike	100	85	115	96
240-159953-D-2 MSD	Matrix Spike Duplicate	99	87	112	92
240-159966-1	TRIP BLANK_117	97	70	102	91
240-159966-2	MW-94S_111021	110	75	115	103
LCS 240-513804/4	Lab Control Sample	100	87	118	98
MB 240-513804/6	Method Blank	105	81	118	101

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159642-H-3 MS	Matrix Spike	87
240-159642-M-3 MSD	Matrix Spike Duplicate	87
240-159966-2	MW-94S_111021	87
LCS 240-513480/3	Lab Control Sample	84
MB 240-513480/4	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513804/6
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 15:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 15:38	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 15:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 15:38	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 15:38	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 15:38	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/19/21 15:38*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/19/21 15:38*	*1*
Toluene-d8 (Surr)	*118*		*78 - 122*		*11/19/21 15:38*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/19/21 15:38*	*1*

Lab Sample ID: LCS 240-513804/4
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	11.0		ug/L		110	63 - 134
cis-1,2-Dichloroethene	10.0	11.0		ug/L		110	77 - 123
Tetrachloroethene	10.0	13.0	*+	ug/L		130	76 - 123
trans-1,2-Dichloroethene	10.0	10.8		ug/L		108	75 - 124
Trichloroethene	10.0	9.54		ug/L		95	70 - 122
Vinyl chloride	10.0	11.1		ug/L		111	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*118*		*78 - 122*
Dibromofluoromethane (Surr)	*98*		*73 - 120*

Lab Sample ID: 240-159953-A-2 MS
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	10.3		ug/L		103	66 - 128
Tetrachloroethene	1.0	U *+	10.0	10.2		ug/L		102	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	56 - 136
Trichloroethene	1.0	U	10.0	8.59		ug/L		86	61 - 124
Vinyl chloride	1.0	U	10.0	10.2		ug/L		102	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*
Toluene-d8 (Surr)	*115*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159953-A-2 MS
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	96		73 - 120

Lab Sample ID: 240-159953-D-2 MSD
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.86		ug/L		99	56 - 135	5	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.79		ug/L		98	66 - 128	5	14
Tetrachloroethene	1.0	U *+	10.0	9.63		ug/L		96	62 - 131	6	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.82		ug/L		98	56 - 136	5	15
Trichloroethene	1.0	U	10.0	8.28		ug/L		83	61 - 124	4	15
Vinyl chloride	1.0	U	10.0	10.7		ug/L		107	43 - 157	5	24

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	99		62 - 137
4-Bromofluorobenzene (Surr)	87		56 - 136
Toluene-d8 (Surr)	112		78 - 122
Dibromofluoromethane (Surr)	92		73 - 120

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513480/4
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 19:58	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	84		66 - 120		11/17/21 19:58	1

Lab Sample ID: LCS 240-513480/3
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.37		ug/L		94	80 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	84		66 - 120

Lab Sample ID: 240-159642-H-3 MS
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.3		ug/L		103	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

Lab Sample ID: 240-159642-M-3 MSD
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.57		ug/L		96	51 - 153	7	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159966-1

GC/MS VOA

Analysis Batch: 513480

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159966-2	MW-94S_111021	Total/NA	Water	8260B SIM	
MB 240-513480/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513480/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159642-H-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159642-M-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513804

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159966-1	TRIP BLANK_117	Total/NA	Water	8260B	
240-159966-2	MW-94S_111021	Total/NA	Water	8260B	
MB 240-513804/6	Method Blank	Total/NA	Water	8260B	
LCS 240-513804/4	Lab Control Sample	Total/NA	Water	8260B	
240-159953-A-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159953-D-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159966-1

Client Sample ID: TRIP BLANK_117

Lab Sample ID: 240-159966-1

Date Collected: 11/10/21 00:00

Matrix: Water

Date Received: 11/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513804	11/19/21 23:07	LEE	TAL CAN

Client Sample ID: MW-94S_111021

Lab Sample ID: 240-159966-2

Date Collected: 11/10/21 16:31

Matrix: Water

Date Received: 11/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513804	11/19/21 23:29	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513480	11/18/21 05:56	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159966-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

05/106

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive Suite 200 / Brighton MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Gary Schafer	TAT if different from below: 10 day; ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No			Job/SDG No
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions
TRIP BLANK_ 117	---	---		X						1					N	G	X	X	X	X	X	X	X (sw)	1 Trip Blank
MW-94S_111021	11/10/21	1631		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159966 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ An Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments

Submit all results through Cadena at jtomalia@cadenaco.com Cadena #E203631
Level IV Reporting requested

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
Gary Schafer	Arcadis	11/10/21 1730	Novi cold storage	Arcadis	11/10/21 1730
Relinquished by	Company	Date/Time	Received by	Company	Date/Time
[signature]	ARCADIS	11/11/21 0950	[signature]	ETA	11/11/21 0950
Relinquished by	Company	Date/Time	Received in Laboratory by	Company	Date/Time
[signature]	ETA	11/11/21 1042	M A.	ETA	11/12/21 8 00

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11/29/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 159966
Canton Facility

Client Arcadis Site Name

Cooler unpacked by: Matthew Surma

Cooler Received on 11/12/21 Opened on 11/12/21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.5 °C Corrected Cooler Temp. 0.6 °C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2 Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3 Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	(No) n.d.k.
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No	(NA) pH Strip Lot# HC157842
14 Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ____	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

No SIM on TB per Corrected COC. DMR 11/12/21

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.

Sample(s) ____ were received in a broken container

Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.

Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen ____

WI-NC-099

DATA VERIFICATION REPORT

November 29, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159966-1
Sample date: 2021-11-10
Report received by CADENA: 2021-11-29
Initial Data Verification completed by CADENA: 2021-11-29
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 513804 LCS recovery was outlying biased high for the following analyte: TETRACHLOROETHENE. Associated client sample results were non-detect so qualification was not required based on this high bias QC outlier.

GCMS VOC QC batch CCV response outliers as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159966-1

		Sample Name:	TRIP BLANK_117				MW-94S_111021			
		Lab Sample ID:	2401599661				2401599662			
		Sample Date:	11/10/2021				11/10/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

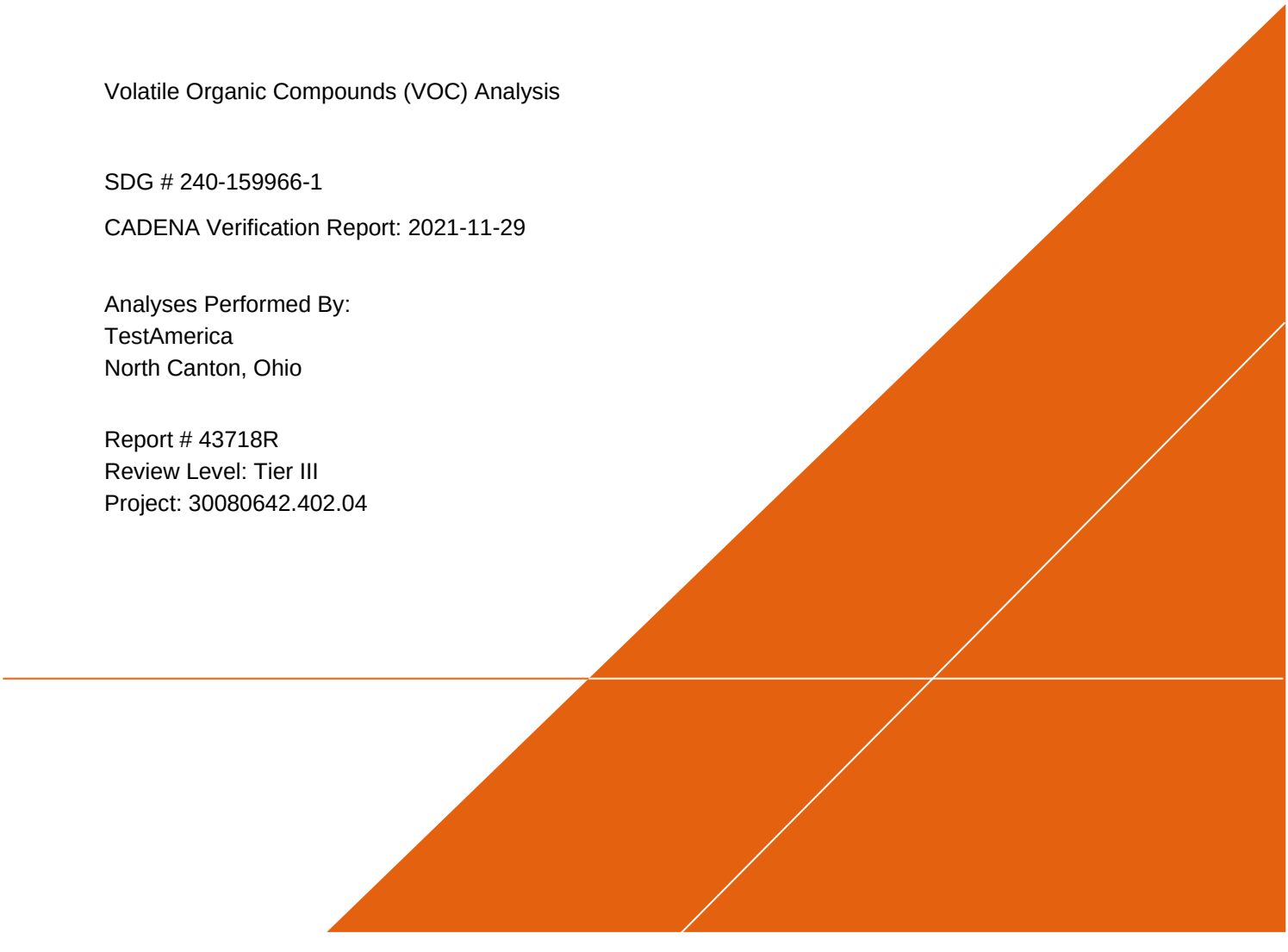
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159966-1

CADENA Verification Report: 2021-11-29

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43718R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159966-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_117	240-159966-1	Water	11/10/21		X	
MW-94S_111021	240-159966-2	Water	11/10/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Compound	Criteria
TRIP BLANK_117 MW-94S_111021	Continuous Calibration Verification %D	Vinyl chloride	+30.0%
		cis-1,2-Dichloroethene	+20.5%
		Tetrachloroethene	+21.1%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J

Initial/Continuing	Criteria	Sample Result	Qualification
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN
190

Chain of Custody Record

05/06

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive Suite 200 / Brighton MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact			
Company Name Arcadis	Regulatory program ☐ DW NPDES ☐ RCRA ☐ Other		
Address. 28550 Cabot Drive, Suite 500	Client Project Manager: Kris Hinskey	Site Contact Julia McClafferty	Lab Contact: Mike DelMonico
City/State/Zip: Novi, MI, 48377	Telephone 248-994-2240	Telephone 734-644-5131	Telephone 330-497-9396
Phone 248-994-2240	Email kristoffer.hinskey@arcadis.com		
Project Name Ford LTP Off-Site	Sampler Name Gary Schafer		
Project Number 30080642.402.04	Method of Shipment/Carrier		
PO # 30080642.402.04	Shipping/Tracking No		

COC No

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No

Analysis Turnaround Time

TAT if different from below

10 day ☑ 2 weeks ☐ 3 weeks ☐ 1 week ☐ 2 days ☐ 1 day

Analyses

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	1 1-DCE 8260B	cis-1 2-DCE 8260B	Trans-1 2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1 4-Dioxane 8260B SIM				Sample Specific Notes / Special Instructions.
TRIP BLANK_ 117	---	---		X						1					N	G	X	X	X	X	X	X	X (ab)				1 Trip Blank
MW-94S_111021	11/10/21	1631		X						6					N	G	X	X	X	X	X	X	X				3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159966 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments

Submit all results through Cadena at jtomalia@cadenaco.com Cadena #E203631
Level IV Reporting requested

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
Gary Schafer	Arcadis	11/10/21 1730	Novi cold storage	Arcadis	11/10/21 1730
[signature]	ARCADIS	11/11/21 0950	[signature]	ETA	11/11/21 0950
[signature]	ETA	11/11/21 1042	Received in Laboratory by M. A. A.	ETA	11/12/21 8 00

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11/29/2021

Client Sample ID: TRIP BLANK_117
Lab Sample ID: 240-159966-1

Date Collected: 11/10/21 00:00
Matrix: Water
Date Received: 11/12/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 23:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 23:07	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 23:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 23:07	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 23:07	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 23:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*62 - 137*		*11/19/21 23:07*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/19/21 23:07*	*1*
Toluene-d8 (Surr)	*102*		*78 - 122*		*11/19/21 23:07*	*1*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*11/19/21 23:07*	*1*

Client Sample ID: MW-94S_111021
Lab Sample ID: 240-159966-2

Date Collected: 11/10/21 16:31
Matrix: Water
Date Received: 11/12/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 05:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*		*11/18/21 05:56*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 23:29	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 23:29	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 23:29	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 23:29	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 23:29	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 23:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*62 - 137*		*11/19/21 23:29*	*1*
4-Bromofluorobenzene (Surr)	*75*		*56 - 136*		*11/19/21 23:29*	*1*
Toluene-d8 (Surr)	*115*		*78 - 122*		*11/19/21 23:29*	*1*
Dibromofluoromethane (Surr)	*103*		*73 - 120*		*11/19/21 23:29*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159136-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/17/2021 10:50:07 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159136-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159136-1

Job ID: 240-159136-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159136-1

Comments
No additional comments.

Receipt
The samples were received on 11/3/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.2º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159136-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159136-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159136-1	TRIP BLANK_14	Water	11/01/21 00:00	11/03/21 08:00
240-159136-2	MW-172S_110121	Water	11/01/21 15:56	11/03/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159136-1

Client Sample ID: TRIP BLANK_14 — Lab Sample ID: 240-159136-1

No Detections.

Client Sample ID: MW-172S_110121 — Lab Sample ID: 240-159136-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159136-1

Client Sample ID: TRIP BLANK_14
Date Collected: 11/01/21 00:00
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159136-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 02:35	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 02:35	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 02:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 02:35	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 02:35	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 02:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/11/21 02:35*	*1*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*		*11/11/21 02:35*	*1*
Toluene-d8 (Surr)	*104*		*78 - 122*		*11/11/21 02:35*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/11/21 02:35*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159136-1

Client Sample ID: MW-172S_110121
Date Collected: 11/01/21 15:56
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159136-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/04/21 22:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*66 - 120*		*11/04/21 22:49*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 02:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 02:57	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 02:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 02:57	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 02:57	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 02:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*11/11/21 02:57*	*1*
4-Bromofluorobenzene (Surr)	*83*		*56 - 136*		*11/11/21 02:57*	*1*
Toluene-d8 (Surr)	*105*		*78 - 122*		*11/11/21 02:57*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/11/21 02:57*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159136-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159136-1	TRIP BLANK_14	92	78	104	94
240-159136-2	MW-172S_110121	96	83	105	96
240-159143-E-3 MSD	Matrix Spike Duplicate	94	97	117	95
240-159143-H-3 MS	Matrix Spike	90	88	108	92
LCS 240-512327/4	Lab Control Sample	88	84	107	90
MB 240-512327/6	Method Blank	92	78	103	91

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159136-2	MW-172S_110121	93
240-159143-G-3 MS	Matrix Spike	91
240-159143-M-3 MSD	Matrix Spike Duplicate	89
LCS 240-511462/4	Lab Control Sample	89
MB 240-511462/5	Method Blank	93

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512327/6
Matrix: Water
Analysis Batch: 512327

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/10/21 23:58	1
cis-1,2-Dichloroethene	0.541	J	1.0	0.46	ug/L			11/10/21 23:58	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/10/21 23:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/10/21 23:58	1
Trichloroethene	0.468	J	1.0	0.44	ug/L			11/10/21 23:58	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/10/21 23:58	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/10/21 23:58*	*1*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*		*11/10/21 23:58*	*1*
Toluene-d8 (Surr)	*103*		*78 - 122*		*11/10/21 23:58*	*1*
Dibromofluoromethane (Surr)	*91*		*73 - 120*		*11/10/21 23:58*	*1*

Lab Sample ID: LCS 240-512327/4
Matrix: Water
Analysis Batch: 512327

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.4		ug/L		104	63 - 134
cis-1,2-Dichloroethene	10.0	10.7		ug/L		107	77 - 123
Tetrachloroethene	10.0	10.6		ug/L		106	76 - 123
trans-1,2-Dichloroethene	10.0	10.0		ug/L		100	75 - 124
Trichloroethene	10.0	9.37		ug/L		94	70 - 122
Vinyl chloride	10.0	8.92		ug/L		89	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*62 - 137*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*
Toluene-d8 (Surr)	*107*		*78 - 122*
Dibromofluoromethane (Surr)	*90*		*73 - 120*

Lab Sample ID: 240-159143-E-3 MSD
Matrix: Water
Analysis Batch: 512327

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.21		ug/L		92	56 - 135	1	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.70		ug/L		97	66 - 128	4	14
Tetrachloroethene	1.0	U	10.0	8.77		ug/L		88	62 - 131	10	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.34		ug/L		93	56 - 136	4	15
Trichloroethene	1.0	U	10.0	7.92		ug/L		79	61 - 124	6	15
Vinyl chloride	1.0	U	10.0	10.1		ug/L		101	43 - 157	6	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*94*		*62 - 137*
4-Bromofluorobenzene (Surr)	*97*		*56 - 136*
Toluene-d8 (Surr)	*117*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159143-E-3 MSD
Matrix: Water
Analysis Batch: 512327

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*95*		*73 - 120*

Lab Sample ID: 240-159143-H-3 MS
Matrix: Water
Analysis Batch: 512327

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.32		ug/L		93	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.36		ug/L		94	66 - 128
Tetrachloroethene	1.0	U	10.0	7.97		ug/L		80	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	8.94		ug/L		89	56 - 136
Trichloroethene	1.0	U	10.0	7.46		ug/L		75	61 - 124
Vinyl chloride	1.0	U	10.0	9.56		ug/L		96	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*88*		*56 - 136*
Toluene-d8 (Surr)	*108*		*78 - 122*
Dibromofluoromethane (Surr)	*92*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-511462/5
Matrix: Water
Analysis Batch: 511462

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/04/21 15:32	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*66 - 120*		*11/04/21 15:32*	*1*

Lab Sample ID: LCS 240-511462/4
Matrix: Water
Analysis Batch: 511462

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.58		ug/L		96	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*66 - 120*

Lab Sample ID: 240-159143-G-3 MS
Matrix: Water
Analysis Batch: 511462

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	9.25		ug/L		92	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*91*		*66 - 120*

Lab Sample ID: 240-159143-M-3 MSD
Matrix: Water
Analysis Batch: 511462

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.63		ug/L		96	51 - 153	4	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*89*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159136-1

GC/MS VOA

Analysis Batch: 511462

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159136-2	MW-172S_110121	Total/NA	Water	8260B SIM	
MB 240-511462/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-511462/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159143-G-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159143-M-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 512327

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159136-1	TRIP BLANK_14	Total/NA	Water	8260B	
240-159136-2	MW-172S_110121	Total/NA	Water	8260B	
MB 240-512327/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512327/4	Lab Control Sample	Total/NA	Water	8260B	
240-159143-E-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	
240-159143-H-3 MS	Matrix Spike	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159136-1

Client Sample ID: TRIP BLANK_14

Lab Sample ID: 240-159136-1

Date Collected: 11/01/21 00:00

Matrix: Water

Date Received: 11/03/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512327	11/11/21 02:35	LEE	TAL CAN

Client Sample ID: MW-172S_110121

Lab Sample ID: 240-159136-2

Date Collected: 11/01/21 15:56

Matrix: Water

Date Received: 11/03/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512327	11/11/21 02:57	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	511462	11/04/21 22:49	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159136-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN

Chain of Custody Record

01102 TestAmerica

TestAmerica Laboratory location: Brighton 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Allyson Hartz	TAT if different from below: 10 day; 3 weeks; ✓ 2 weeks; 1 week; 2 days; 1 day		Walk-in client; Lab sampling; Job/SDG No:
Phone: 248-994-2240	Method of Shipment/Carrier:			
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_14	---	---		X						1					N	6	X	X	X	X	X	X	X	1 Trip Blank
MW-1725_111221	11/1/21	1556		X						6					N	6	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159136 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; ✓ Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit a results through Cadena at jtomaia@cadenaco.com Cadena #E20363
Level Reporting requested

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
[signature]	Arcadis	11/1/21 1700	Navigator storage	Arcadis	11/1/21 1700
[signature]	Arcadis	11/2/21 1250	[signature]	GTA	11/2/21 1250
[signature]	GTA	11/2/21 1281	[signature]	ETA	11/3/21 8:00 AM

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11/17/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159136**
Canton Facility

Client ARCADIS Site Name

Cooler unpacked by: Matthew Sarna

Cooler Received on 11/3/21 Opened on 11/3/21

FedEx. 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used. (Bubble Wrap) Foam Plastic Bag None Other

COOLANT (Wet Ice) Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp 0.1 °C Corrected Cooler Temp 0.2 °C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp °C

2	Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
	Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
	-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
	-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3	Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4	Did custody papers accompany the sample(s)?	(Yes)	No
5	Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No BB
6	Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	(No)
7	Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8	Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9	For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10	Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11	Sufficient quantity received to perform indicated analyses?	(Yes)	(No) BB
12	Are these work share samples and all listed on the COC?	Yes	(No)
	If yes, Questions 13-17 have been checked at the originating laboratory		
13	Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# HC157842
14	Were VOAs on the COC?	(Yes)	No
15	Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	(No) NA
16	Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 010420 16	(Yes)	No
17	Was a LL Hg or Me Hg trip blank present?	Yes	(No)

Tests that are not checked for pH by Receiving

VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

trip blank does not receive 8260 SIM - BB

19 SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.

Sample(s) were received in a broken container

Sample(s) were received with bubble >6 mm in diameter (Notify PM)

20 SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory

Time preserved. Preservative(s) added/Lot number(s)

VOA Sample Preservation Date/Time VOAs Frozen.

DATA VERIFICATION REPORT

November 17, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159136-1
Sample date: 2021-11-01
Report received by CADENA: 2021-11-17
Initial Data Verification completed by CADENA: 2021-11-17
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 512327 method blank had detections below the RL for the following analytes: CIS-1,2-DICHLOROETHENE and TRICHLOROETHENE. Qualification of client sample results was not required based on these method blank detections.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

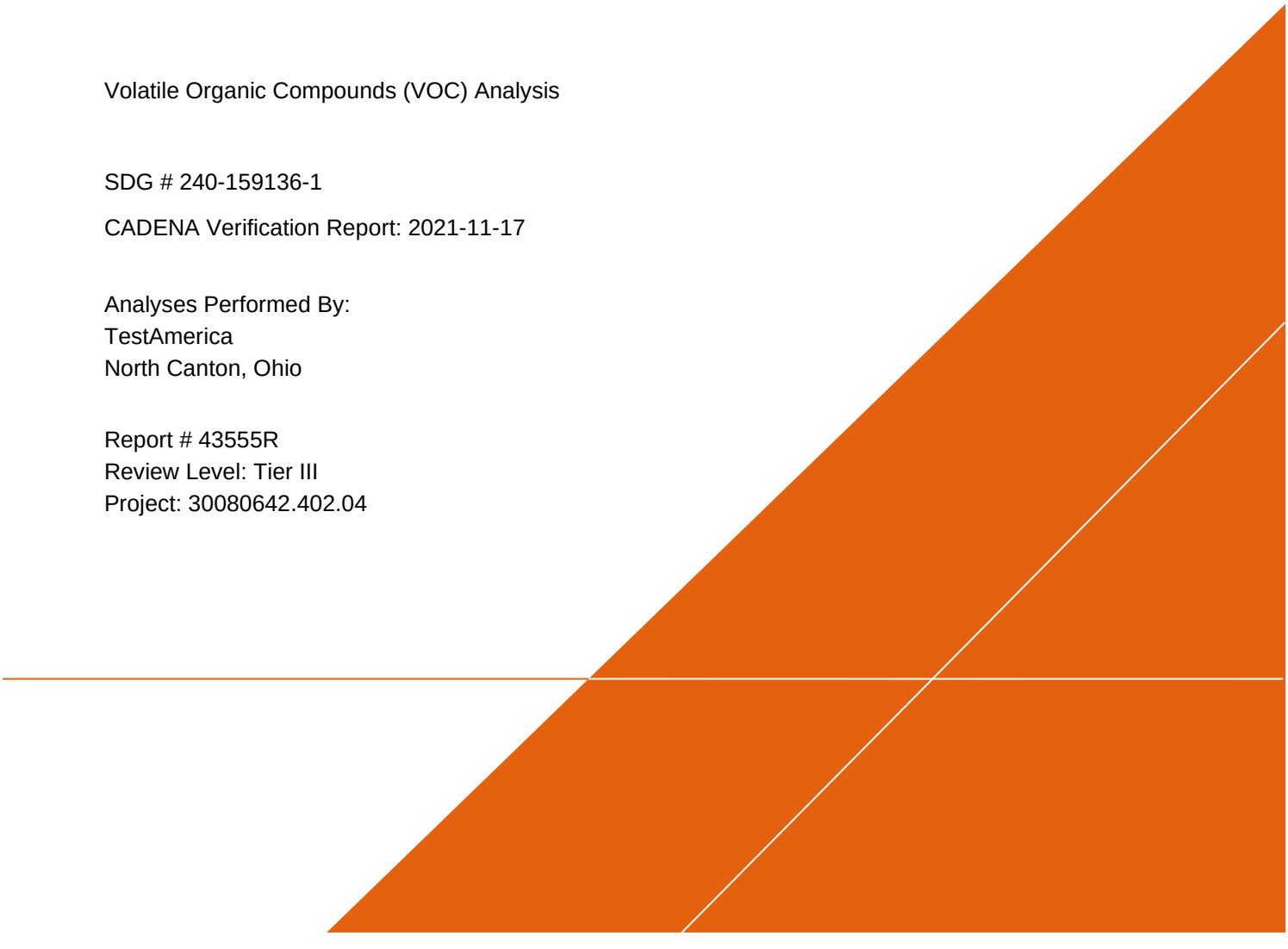
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159136-1

CADENA Verification Report: 2021-11-17

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43555R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159136-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_14	240-159136-1	Water	11/01/21		X	
MW-172S_110121	240-159136-2	Water	11/01/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE: 

DATE: December 02, 2021

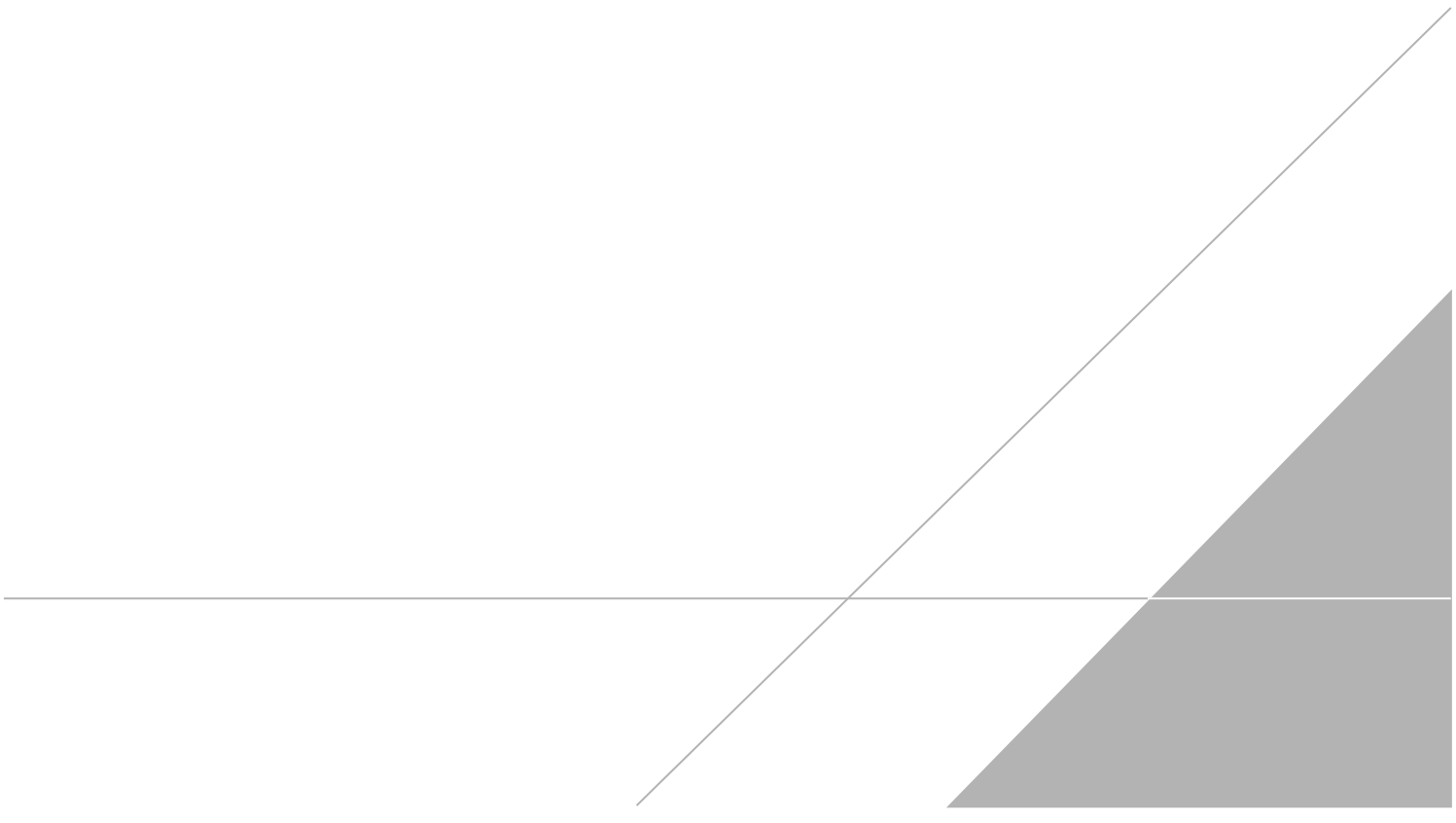
PEER REVIEW: Andrew Korycinski

DATE: December 2, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



MICHIGAN

Chain of Custody Record

01/02 TestAmerica

TestAmerica Laboratory location Brighton 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

Client Contact

Company Name: Arcadis
Address: 28550 Cabot Drive, Suite 500
City/State/Zip: Novi, MI, 48377
Phone: 248-994-2240
Project Name: Ford LTP Off-Site
Project Number: 30080642.402.04
PO # 30080642.402.04

Client Project Manager: Kris Hinskey
Telephone: 248-994-2240
Email: kristoffer.hinskey@arcadis.com
Sampler Name: Allyson Hartz
Method of Shipment/Carrier:
Shipping/Tracking No:

Site Contact: Julia McClafferty
Telephone. 734-644-5131

Lab Contact: Mike DelMonico
Telephone: 330-497-9396

TestAmerica Laboratories, Inc.
COC No:
1 of 1 COCs
For lab use only
Walk-in client
Lab sampling
Job/SDG No:

Analysis Turnaround Time
TAT if differer from below
10 day ✓ 3 weeks, 2 weeks, 1 week, 2 days, 1 day

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_14	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1725_110121	11/1/21	1556		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159136 Chain of Custody

Possible Hazard Identification
✓ Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Return to Client ✓ Disposal By Lab Archive For Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomaria@cadenaco.com Cadena #E20363
Level Reporting requested

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
[signature]	Arcadis	11/1/21 1700	Novi cold storage	Arcadis	11/1/21 1700
[signature]	Arcadis	11/2/21 1250	[signature]	GTA	11/2/21 125
[signature]	GTA	11/2/21 1281	Received in Laboratory by [signature]	ETA	11/3/21 8:00 AM

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Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159136-1

Client Sample ID: TRIP BLANK_14
Date Collected: 11/01/21 00:00
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159136-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 02:35	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 02:35	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 02:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 02:35	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 02:35	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 02:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/11/21 02:35*	*1*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*		*11/11/21 02:35*	*1*
Toluene-d8 (Surr)	*104*		*78 - 122*		*11/11/21 02:35*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/11/21 02:35*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159136-1

Client Sample ID: MW-172S_110121
Date Collected: 11/01/21 15:56
Date Received: 11/03/21 08:00

Lab Sample ID: 240-159136-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/04/21 22:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*66 - 120*		*11/04/21 22:49*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 02:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 02:57	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 02:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 02:57	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 02:57	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 02:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*11/11/21 02:57*	*1*
4-Bromofluorobenzene (Surr)	*83*		*56 - 136*		*11/11/21 02:57*	*1*
Toluene-d8 (Surr)	*105*		*78 - 122*		*11/11/21 02:57*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/11/21 02:57*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159527-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/22/2021 9:25:27 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159527-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159527-1

Job ID: 240-159527-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159527-1

Comments
No additional comments.

Receipt
The samples were received on 11/6/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.0º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159527-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159527-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159527-1	TRIP BLANK_38	Water	11/04/21 00:00	11/06/21 08:00
240-159527-2	MW-121S_110421	Water	11/04/21 13:20	11/06/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159527-1

Client Sample ID: TRIP BLANK_38 — Lab Sample ID: 240-159527-1

No Detections.

Client Sample ID: MW-121S_110421 — Lab Sample ID: 240-159527-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159527-1

Client Sample ID: TRIP BLANK_38

Date Collected: 11/04/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159527-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 01:21	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 01:21	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 01:21	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 01:21	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 01:21	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 01:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*62 - 137*		*11/13/21 01:21*	*1*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*		*11/13/21 01:21*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/13/21 01:21*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*11/13/21 01:21*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159527-1

Client Sample ID: MW-121S_110421
Date Collected: 11/04/21 13:20
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159527-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 05:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*11/12/21 05:01*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 01:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 01:44	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 01:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 01:44	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 01:44	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 01:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*62 - 137*		*11/13/21 01:44*	*1*
4-Bromofluorobenzene (Surr)	*75*		*56 - 136*		*11/13/21 01:44*	*1*
Toluene-d8 (Surr)	*104*		*78 - 122*		*11/13/21 01:44*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/13/21 01:44*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159527-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159527-1	TRIP BLANK_38	97	78	108	95
240-159527-2	MW-121S_110421	94	75	104	94
240-159536-A-3 MS	Matrix Spike	93	86	114	94
240-159536-E-3 MSD	Matrix Spike Duplicate	98	93	112	97
LCS 240-512748/4	Lab Control Sample	93	91	113	93
MB 240-512748/6	Method Blank	92	79	103	92

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159418-H-2 MS	Matrix Spike	82
240-159418-P-2 MSD	Matrix Spike Duplicate	83
240-159527-2	MW-121S_110421	83
LCS 240-512585/4	Lab Control Sample	81
MB 240-512585/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512748/6
Matrix: Water
Analysis Batch: 512748

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 23:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 23:07	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 23:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 23:07	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 23:07	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 23:07	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/12/21 23:07*	*1*
4-Bromofluorobenzene (Surr)	*79*		*56 - 136*		*11/12/21 23:07*	*1*
Toluene-d8 (Surr)	*103*		*78 - 122*		*11/12/21 23:07*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*11/12/21 23:07*	*1*

Lab Sample ID: LCS 240-512748/4
Matrix: Water
Analysis Batch: 512748

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.3		ug/L		103	63 - 134
cis-1,2-Dichloroethene	10.0	9.94		ug/L		99	77 - 123
Tetrachloroethene	10.0	10.8		ug/L		108	76 - 123
trans-1,2-Dichloroethene	10.0	10.1		ug/L		101	75 - 124
Trichloroethene	10.0	8.81		ug/L		88	70 - 122
Vinyl chloride	10.0	10.0		ug/L		100	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*91*		*56 - 136*
Toluene-d8 (Surr)	*113*		*78 - 122*
Dibromofluoromethane (Surr)	*93*		*73 - 120*

Lab Sample ID: 240-159536-A-3 MS
Matrix: Water
Analysis Batch: 512748

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.26		ug/L		93	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	10.1		ug/L		101	66 - 128
Tetrachloroethene	1.0	U	10.0	9.29		ug/L		93	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.49		ug/L		95	56 - 136
Trichloroethene	1.0	U	10.0	7.71		ug/L		77	61 - 124
Vinyl chloride	1.0	U	10.0	8.69		ug/L		87	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*86*		*56 - 136*
Toluene-d8 (Surr)	*114*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159536-A-3 MS
Matrix: Water
Analysis Batch: 512748

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: 240-159536-E-3 MSD
Matrix: Water
Analysis Batch: 512748

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.41		ug/L		94	56 - 135	2	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.89		ug/L		99	66 - 128	2	14
Tetrachloroethene	1.0	U	10.0	9.07		ug/L		91	62 - 131	2	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.73		ug/L		97	56 - 136	2	15
Trichloroethene	1.0	U	10.0	7.96		ug/L		80	61 - 124	3	15
Vinyl chloride	1.0	U	10.0	9.96		ug/L		100	43 - 157	14	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*
4-Bromofluorobenzene (Surr)	*93*		*56 - 136*
Toluene-d8 (Surr)	*112*		*78 - 122*
Dibromofluoromethane (Surr)	*97*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512585/5
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/11/21 19:04	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/11/21 19:04*	*1*

Lab Sample ID: LCS 240-512585/4
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.86		ug/L		99	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*

Lab Sample ID: 240-159418-H-2 MS
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	11.1		ug/L		111	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159418-P-2 MSD
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.2		ug/L		102	51 - 153	8	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159527-1

GC/MS VOA

Analysis Batch: 512585

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159527-2	MW-121S_110421	Total/NA	Water	8260B SIM	
MB 240-512585/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512585/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159418-H-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159418-P-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 512748

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159527-1	TRIP BLANK_38	Total/NA	Water	8260B	
240-159527-2	MW-121S_110421	Total/NA	Water	8260B	
MB 240-512748/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512748/4	Lab Control Sample	Total/NA	Water	8260B	
240-159536-A-3 MS	Matrix Spike	Total/NA	Water	8260B	
240-159536-E-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159527-1

Client Sample ID: TRIP BLANK_38

Lab Sample ID: 240-159527-1

Date Collected: 11/04/21 00:00

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512748	11/13/21 01:21	LEE	TAL CAN

Client Sample ID: MW-121S_110421

Lab Sample ID: 240-159527-2

Date Collected: 11/04/21 13:20

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512748	11/13/21 01:44	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512585	11/12/21 05:01	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159527-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	For lab use only
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		Walk-in client
Phone: 248-994-2240	Sampler Name: Seth Turner	TAT if different from below: 10 day; 3 weeks / 2 weeks / 1 week / 2 days / 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30080642.402.04	Shipping/Tracking No:			
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_38	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-121S_110421	11/4/21	1320		X						G					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159527 Chain of Custody

Possible Hazard Identification: Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / Disposal By Lab / Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	11/4/21 1500	Novi cold Storage	Arcadis	11/4/21 1500
[signature]	ARCADIS	11/5/21 1435	[signature]	ETA	11/5/21 1435
[signature]	ETA	11/5/21 1448	[signature]	ETA	11/6/21 8:00

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11/22/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 159527

Client ARCADIS Site Name

Cooler Received on 11/6/21 Opened on 11/6/21

Cooler unpacked by: Matthew Surma

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.9 °C Corrected Cooler Temp. 1.0 °C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes) No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes) No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes (No)
-Were tamper/custody seals intact and uncompromised?	(Yes) No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes (No)
4. Did custody papers accompany the sample(s)?	(Yes) No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes) No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?	
10. Were correct bottle(s) used for the test(s) indicated?	(Yes) No
11. Sufficient quantity received to perform indicated analyses?	(Yes) No
12. Are these work share samples and all listed on the COC?	Yes (No)
If yes, Questions 13-17 have been checked at the originating laboratory.	
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No (NA) pH Strip Lot# HC157842
14. Were VOAs on the COC?	(Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #0104201G	(Yes) No
17. Was a LL Hg or Me Hg trip blank present?	Yes (No)

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.

Sample(s) were received in a broken container.

Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.

Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

WI-NC-099

DATA VERIFICATION REPORT

November 22, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159527-1
Sample date: 2021-11-04
Report received by CADENA: 2021-11-22
Initial Data Verification completed by CADENA: 2021-11-22
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159527-1

		Sample Name:	TRIP BLANK_38				MW-121S_110421			
		Lab Sample ID:	2401595271				2401595272			
		Sample Date:	11/4/2021				11/4/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

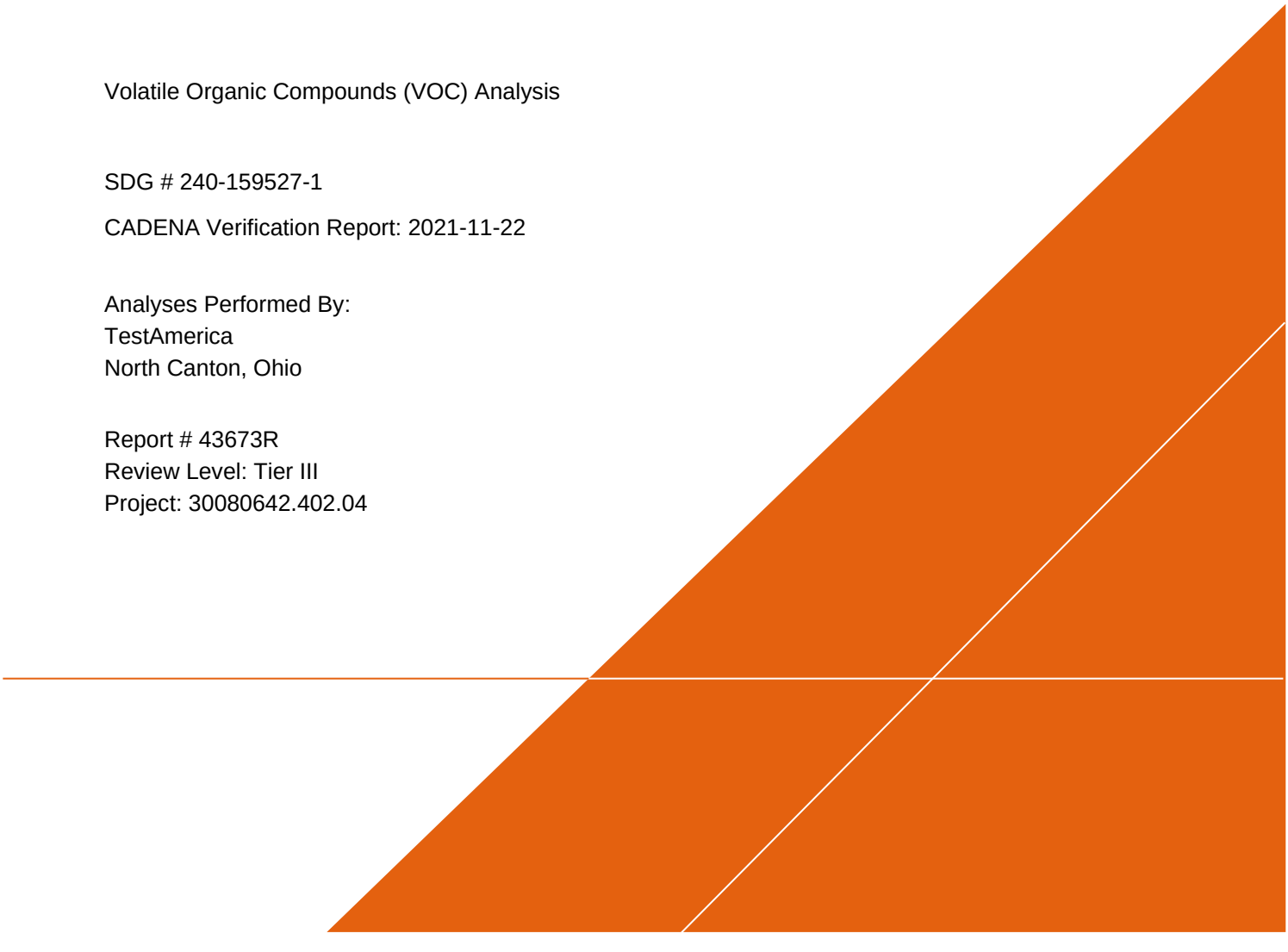
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159527-1

CADENA Verification Report: 2021-11-22

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43673R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159527-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_38	240-159527-1	Water	11/04/21		X	
MW-121S_110421	240-159527-2	Water	11/04/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 09, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 09, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Seth Turner	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAcr NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM				Sample Specific Notes / Special Instructions:
TRIP BLANK_38	—	—		X						1					N	G	X	X	X	X	X	X	X				1 Trip Blank
MW-121S_110421	11/4/21	1320		X						6					N	G	X	X	X	X	X	X	X				3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159527 Chain of Custody

Possible Hazard Identification
Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Return to Client Disposal By Lab Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Seth Turner	Arcadis	11/4/21 1500	Novi cold Storage	Arcadis	11/4/21 1500
Christin Allen	ARCADIS	11/5/21 1435	Jeri Hall	ETA	11/5/21 1435
Jeri Hall	ETA	11/5/21 1448	Received in Laboratory by: M. L.	ETA	11/6/21 8:00

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Client Sample ID: TRIP BLANK_38
Lab Sample ID: 240-159527-1
Date Collected: 11/04/21 00:00
Matrix: Water
Date Received: 11/06/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 01:21	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 01:21	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 01:21	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 01:21	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 01:21	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 01:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*62 - 137*		*11/13/21 01:21*	*1*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*		*11/13/21 01:21*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/13/21 01:21*	*1*
Dibromofluoromethane (Surr)	*95*		*73 - 120*		*11/13/21 01:21*	*1*

Client Sample ID: MW-121S_110421
Lab Sample ID: 240-159527-2
Date Collected: 11/04/21 13:20
Matrix: Water
Date Received: 11/06/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 05:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*11/12/21 05:01*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 01:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 01:44	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 01:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 01:44	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 01:44	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 01:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*62 - 137*		*11/13/21 01:44*	*1*
4-Bromofluorobenzene (Surr)	*75*		*56 - 136*		*11/13/21 01:44*	*1*
Toluene-d8 (Surr)	*104*		*78 - 122*		*11/13/21 01:44*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/13/21 01:44*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159963-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/29/2021 8:41:03 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159963-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159963-1

Job ID: 240-159963-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159963-1

Comments
No additional comments.

Receipt
The samples were received on 11/12/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.6º C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) associated with batch 513804 recovered above the upper control limit for Vinyl Chloride. The samples associated with this CCV were non-detect for the affected analyte; therefore, the data have been reported. The associated samples are impacted: TRIP BLANK_106 (240-159963-1) and MW-173S_111021 (240-159963-2).

Method 8260B: The laboratory control sample (LCS) for 513804 recovered outside control limits for Tetrachloroethene. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159963-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159963-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159963-1	TRIP BLANK_106	Water	11/10/21 00:00	11/12/21 08:00
240-159963-2	MW-173S_111021	Water	11/10/21 12:11	11/12/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159963-1

Client Sample ID: TRIP BLANK_106 — Lab Sample ID: 240-159963-1

No Detections.

Client Sample ID: MW-173S_111021 — Lab Sample ID: 240-159963-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159963-1

Client Sample ID: TRIP BLANK_106

Date Collected: 11/10/21 00:00
Date Received: 11/12/21 08:00

Lab Sample ID: 240-159963-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 21:37	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 21:37	1
Tetrachloroethene	1.0	U *+	1.0	0.44	ug/L			11/19/21 21:37	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 21:37	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 21:37	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 21:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*62 - 137*		*11/19/21 21:37*	*1*
4-Bromofluorobenzene (Surr)	*79*		*56 - 136*		*11/19/21 21:37*	*1*
Toluene-d8 (Surr)	*97*		*78 - 122*		*11/19/21 21:37*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/19/21 21:37*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159963-1

Client Sample ID: MW-173S_111021
Date Collected: 11/10/21 12:11
Date Received: 11/12/21 08:00

Lab Sample ID: 240-159963-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 05:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*66 - 120*		*11/18/21 05:08*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 21:59	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 21:59	1
Tetrachloroethene	1.0	U *+	1.0	0.44	ug/L			11/19/21 21:59	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 21:59	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 21:59	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 21:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*		*11/19/21 21:59*	*1*
4-Bromofluorobenzene (Surr)	*66*		*56 - 136*		*11/19/21 21:59*	*1*
Toluene-d8 (Surr)	*106*		*78 - 122*		*11/19/21 21:59*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/19/21 21:59*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159963-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159953-A-2 MS	Matrix Spike	100	85	115	96
240-159953-D-2 MSD	Matrix Spike Duplicate	99	87	112	92
240-159963-1	TRIP BLANK_106	108	79	97	100
240-159963-2	MW-173S_111021	98	66	106	94
LCS 240-513804/4	Lab Control Sample	100	87	118	98
MB 240-513804/6	Method Blank	105	81	118	101

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159642-H-3 MS	Matrix Spike	87
240-159642-M-3 MSD	Matrix Spike Duplicate	87
240-159963-2	MW-173S_111021	89
LCS 240-513480/3	Lab Control Sample	84
MB 240-513480/4	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513804/6
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 15:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 15:38	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 15:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 15:38	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 15:38	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 15:38	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/19/21 15:38*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/19/21 15:38*	*1*
Toluene-d8 (Surr)	*118*		*78 - 122*		*11/19/21 15:38*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/19/21 15:38*	*1*

Lab Sample ID: LCS 240-513804/4
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	11.0		ug/L		110	63 - 134
cis-1,2-Dichloroethene	10.0	11.0		ug/L		110	77 - 123
Tetrachloroethene	10.0	13.0	*+	ug/L		130	76 - 123
trans-1,2-Dichloroethene	10.0	10.8		ug/L		108	75 - 124
Trichloroethene	10.0	9.54		ug/L		95	70 - 122
Vinyl chloride	10.0	11.1		ug/L		111	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*118*		*78 - 122*
Dibromofluoromethane (Surr)	*98*		*73 - 120*

Lab Sample ID: 240-159953-A-2 MS
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	10.3		ug/L		103	66 - 128
Tetrachloroethene	1.0	U *+	10.0	10.2		ug/L		102	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	56 - 136
Trichloroethene	1.0	U	10.0	8.59		ug/L		86	61 - 124
Vinyl chloride	1.0	U	10.0	10.2		ug/L		102	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*
Toluene-d8 (Surr)	*115*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159953-A-2 MS
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*96*		*73 - 120*

Lab Sample ID: 240-159953-D-2 MSD
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.86		ug/L		99	56 - 135	5	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.79		ug/L		98	66 - 128	5	14
Tetrachloroethene	1.0	U *+	10.0	9.63		ug/L		96	62 - 131	6	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.82		ug/L		98	56 - 136	5	15
Trichloroethene	1.0	U	10.0	8.28		ug/L		83	61 - 124	4	15
Vinyl chloride	1.0	U	10.0	10.7		ug/L		107	43 - 157	5	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*112*		*78 - 122*
Dibromofluoromethane (Surr)	*92*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513480/4
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 19:58	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/17/21 19:58*	*1*

Lab Sample ID: LCS 240-513480/3
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.37		ug/L		94	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*

Lab Sample ID: 240-159642-H-3 MS
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.3		ug/L		103	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

Lab Sample ID: 240-159642-M-3 MSD
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.57		ug/L		96	51 - 153	7	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159963-1

GC/MS VOA

Analysis Batch: 513480

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159963-2	MW-173S_111021	Total/NA	Water	8260B SIM	
MB 240-513480/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513480/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159642-H-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159642-M-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513804

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159963-1	TRIP BLANK_106	Total/NA	Water	8260B	
240-159963-2	MW-173S_111021	Total/NA	Water	8260B	
MB 240-513804/6	Method Blank	Total/NA	Water	8260B	
LCS 240-513804/4	Lab Control Sample	Total/NA	Water	8260B	
240-159953-A-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159953-D-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159963-1

Client Sample ID: TRIP BLANK_106

Lab Sample ID: 240-159963-1

Date Collected: 11/10/21 00:00

Matrix: Water

Date Received: 11/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513804	11/19/21 21:37	LEE	TAL CAN

Client Sample ID: MW-173S_111021

Lab Sample ID: 240-159963-2

Date Collected: 11/10/21 12:11

Matrix: Water

Date Received: 11/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513804	11/19/21 21:59	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513480	11/18/21 05:08	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159963-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton -- 10448 Citation Drive Suite 200 / Brighton MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No: 1 of 1 COCs
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: 10 day; ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day	For lab use only: Walk-in client; Lab sampling; Job/SDG No
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier		
Project Number: 30080642.402.04	Shipping/Tracking No		
PO # 30080642.402.04			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions
TRIP BLANK_106	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1735-111021	11/10/21	12:11		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159963 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com Cadena #E203631
Level IV Reporting requested

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
Gary Schafer	Arcadis	11/10/21 1724	Novi cold storage	Arcadis	11/10/21 1724
[signature]	ARCADIS	11/11/21 0950	[signature]	ETA	11/11/21 0950
[signature]	ETA	11-11-21 1046	Received in Laboratory by: M. Sid.	ETA	11/12/21 8:00

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11/29/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159963**
Canton Facility

Client Arcadis Site Name

Cooler Received on 11/12/21 Opened on 11/12/21

Cooler unpacked by: Matthew Surma

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.5 °C Corrected Cooler Temp. 0.6 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# HC157842
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ____ (Yes) No
17. Was a LL Hg or Me Hg trip blank present? ____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

No SIM on TB per Corrected COC. DMR 11/12/21

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

November 29, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159963-1
Sample date: 2021-11-10
Report received by CADENA: 2021-11-29
Initial Data Verification completed by CADENA: 2021-11-29
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 513804 LCS recovery was outlying biased high for the following analyte: TETRACHLOROETHENE. Associated client sample results were non-detect so qualification was not required based on this high bias QC outlier.

GCMS VOC QC batch CCV response outliers as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159963-1

		Sample Name:	TRIP BLANK_106				MW-173S_111021			
		Lab Sample ID:	2401599631				2401599632			
		Sample Date:	11/10/2021				11/10/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

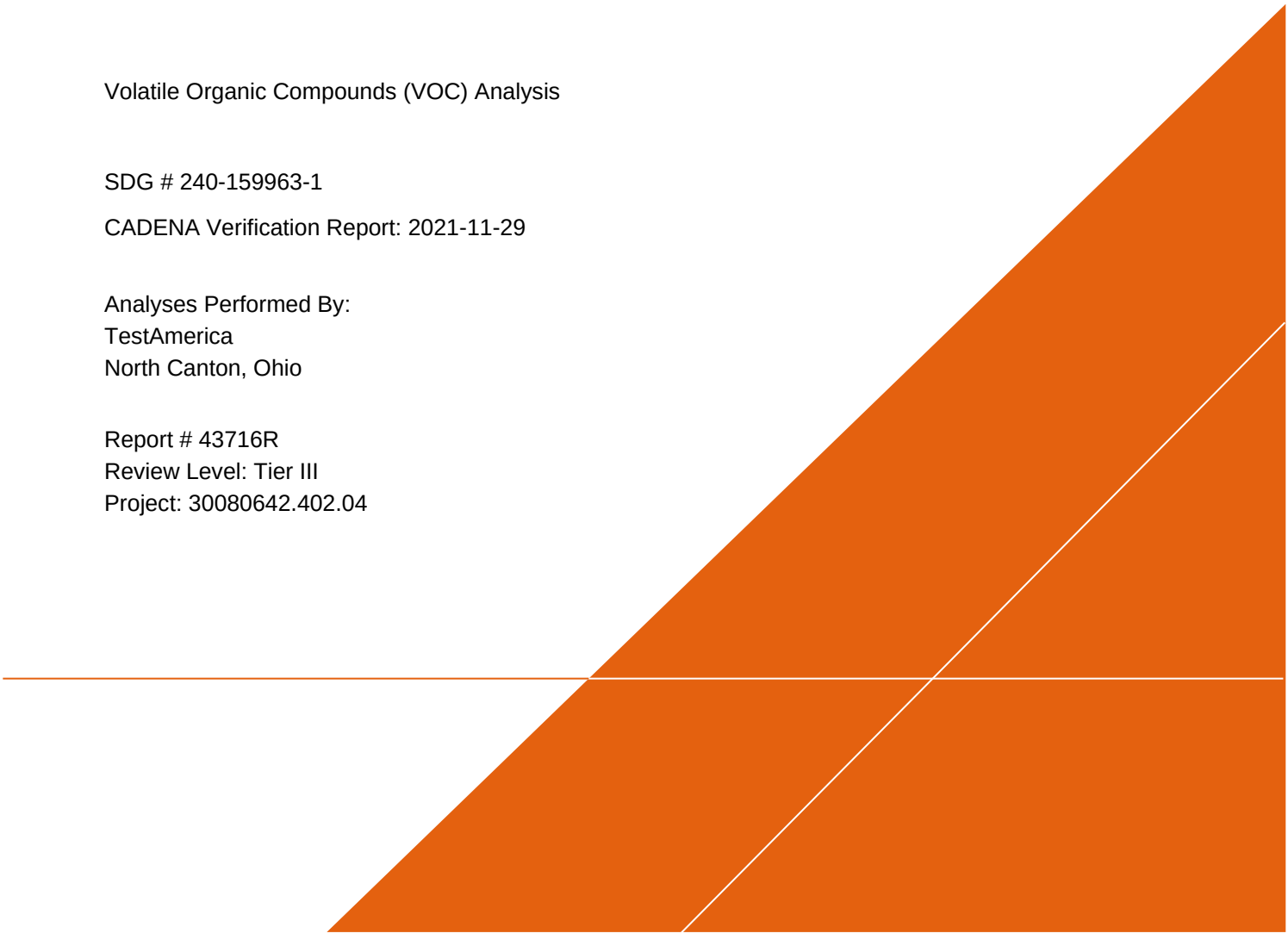
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159963-1

CADENA Verification Report: 2021-11-29

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43716R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159963-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_106	240-159963-1	Water	11/10/21		X	
MW-173S_111021	240-159963-2	Water	11/10/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Compound	Criteria
TRIP BLANK_106 MW-173S_111021	Continuous Calibration Verification %D	Vinyl chloride	+30.0%
		cis-1,2-Dichloroethene	+20.5%
		Tetrachloroethene	+21.1%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J

Initial/Continuing	Criteria	Sample Result	Qualification
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive Suite 200 / Brighton MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No: 1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	For lab use only
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		Walk-in client
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: 10 day; ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier			Job/SDG No
Project Number: 30080642.402.04	Shipping/Tracking No			
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y/N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions
TRIP BLANK_106	---	---		X						1					N	G	X	X	X	X	X	X	* (2W)	1 Trip Blank
MW-1735-111021	11/10/21	12:11		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159963 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com Cadena #E203631
Level IV Reporting requested

	Company	Date/Time		Company	Date/Time
Relinquished by: Gary Schafer	Arcadis	11/10/21 1724	Received by: Novi cold storage	Arcadis	11/10/21 1724
Relinquished by:	Arcadis	11/11/21 0950	Received by:	ETA	11/11/21 0950
Relinquished by:	ETA	11-11-21 1046	Received in Laboratory by:	ETA	Date/Time 11/12/21 8:00

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11/29/2021

Client Sample ID: TRIP BLANK_106
Lab Sample ID: 240-159963-1
Date Collected: 11/10/21 00:00
Matrix: Water
Date Received: 11/12/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 21:37	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 21:37	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 21:37	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 21:37	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 21:37	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 21:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*62 - 137*		*11/19/21 21:37*	*1*
4-Bromofluorobenzene (Surr)	*79*		*56 - 136*		*11/19/21 21:37*	*1*
Toluene-d8 (Surr)	*97*		*78 - 122*		*11/19/21 21:37*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/19/21 21:37*	*1*

Client Sample ID: MW-173S_111021
Lab Sample ID: 240-159963-2
Date Collected: 11/10/21 12:11
Matrix: Water
Date Received: 11/12/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 05:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*66 - 120*		*11/18/21 05:08*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 21:59	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 21:59	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 21:59	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 21:59	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 21:59	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 21:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*		*11/19/21 21:59*	*1*
4-Bromofluorobenzene (Surr)	*66*		*56 - 136*		*11/19/21 21:59*	*1*
Toluene-d8 (Surr)	*106*		*78 - 122*		*11/19/21 21:59*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/19/21 21:59*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159965-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/29/2021 8:41:36 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159965-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159965-1

Job ID: 240-159965-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159965-1

Comments
No additional comments.

Receipt
The samples were received on 11/12/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.6º C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) associated with batch 513804 recovered above the upper control limit for Vinyl Chloride. The samples associated with this CCV were non-detect for the affected analyte; therefore, the data have been reported. The associated samples are impacted: TRIP BLANK_105 (240-159965-1) and MW-93S_111021 (240-159965-2).

Method 8260B: The laboratory control sample (LCS) for 513804 recovered outside control limits for Tetrachloroethene. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159965-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159965-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159965-1	TRIP BLANK_105	Water	11/10/21 00:00	11/12/21 08:00
240-159965-2	MW-93S_111021	Water	11/10/21 14:11	11/12/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159965-1

Client Sample ID: TRIP BLANK_105 — Lab Sample ID: 240-159965-1

No Detections.

Client Sample ID: MW-93S_111021 — Lab Sample ID: 240-159965-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159965-1

Client Sample ID: TRIP BLANK_105
Date Collected: 11/10/21 00:00
Date Received: 11/12/21 08:00

Lab Sample ID: 240-159965-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 22:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 22:22	1
Tetrachloroethene	1.0	U *+	1.0	0.44	ug/L			11/19/21 22:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 22:22	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 22:22	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 22:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*62 - 137*		*11/19/21 22:22*	*1*
4-Bromofluorobenzene (Surr)	*75*		*56 - 136*		*11/19/21 22:22*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/19/21 22:22*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/19/21 22:22*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159965-1

Client Sample ID: MW-93S_111021
Date Collected: 11/10/21 14:11
Date Received: 11/12/21 08:00

Lab Sample ID: 240-159965-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 05:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*66 - 120*		*11/18/21 05:32*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 22:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 22:44	1
Tetrachloroethene	1.0	U *+	1.0	0.44	ug/L			11/19/21 22:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 22:44	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 22:44	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 22:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*62 - 137*		*11/19/21 22:44*	*1*
4-Bromofluorobenzene (Surr)	*72*		*56 - 136*		*11/19/21 22:44*	*1*
Toluene-d8 (Surr)	*120*		*78 - 122*		*11/19/21 22:44*	*1*
Dibromofluoromethane (Surr)	*104*		*73 - 120*		*11/19/21 22:44*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159965-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159953-A-2 MS	Matrix Spike	100	85	115	96
240-159953-D-2 MSD	Matrix Spike Duplicate	99	87	112	92
240-159965-1	TRIP BLANK_105	104	75	108	100
240-159965-2	MW-93S_111021	110	72	120	104
LCS 240-513804/4	Lab Control Sample	100	87	118	98
MB 240-513804/6	Method Blank	105	81	118	101

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159642-H-3 MS	Matrix Spike	87
240-159642-M-3 MSD	Matrix Spike Duplicate	87
240-159965-2	MW-93S_111021	89
LCS 240-513480/3	Lab Control Sample	84
MB 240-513480/4	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513804/6
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 15:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 15:38	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 15:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 15:38	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 15:38	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 15:38	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/19/21 15:38*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/19/21 15:38*	*1*
Toluene-d8 (Surr)	*118*		*78 - 122*		*11/19/21 15:38*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/19/21 15:38*	*1*

Lab Sample ID: LCS 240-513804/4
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	11.0		ug/L		110	63 - 134
cis-1,2-Dichloroethene	10.0	11.0		ug/L		110	77 - 123
Tetrachloroethene	10.0	13.0	*+	ug/L		130	76 - 123
trans-1,2-Dichloroethene	10.0	10.8		ug/L		108	75 - 124
Trichloroethene	10.0	9.54		ug/L		95	70 - 122
Vinyl chloride	10.0	11.1		ug/L		111	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*118*		*78 - 122*
Dibromofluoromethane (Surr)	*98*		*73 - 120*

Lab Sample ID: 240-159953-A-2 MS
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	10.3		ug/L		103	66 - 128
Tetrachloroethene	1.0	U *+	10.0	10.2		ug/L		102	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	56 - 136
Trichloroethene	1.0	U	10.0	8.59		ug/L		86	61 - 124
Vinyl chloride	1.0	U	10.0	10.2		ug/L		102	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*
Toluene-d8 (Surr)	*115*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159953-A-2 MS
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	96		73 - 120

Lab Sample ID: 240-159953-D-2 MSD
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.86		ug/L		99	56 - 135	5	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.79		ug/L		98	66 - 128	5	14
Tetrachloroethene	1.0	U *+	10.0	9.63		ug/L		96	62 - 131	6	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.82		ug/L		98	56 - 136	5	15
Trichloroethene	1.0	U	10.0	8.28		ug/L		83	61 - 124	4	15
Vinyl chloride	1.0	U	10.0	10.7		ug/L		107	43 - 157	5	24

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	99		62 - 137
4-Bromofluorobenzene (Surr)	87		56 - 136
Toluene-d8 (Surr)	112		78 - 122
Dibromofluoromethane (Surr)	92		73 - 120

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513480/4
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 19:58	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	84		66 - 120		11/17/21 19:58	1

Lab Sample ID: LCS 240-513480/3
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.37		ug/L		94	80 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	84		66 - 120

Lab Sample ID: 240-159642-H-3 MS
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.3		ug/L		103	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

Lab Sample ID: 240-159642-M-3 MSD
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.57		ug/L		96	51 - 153	7	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159965-1

GC/MS VOA

Analysis Batch: 513480

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159965-2	MW-93S_111021	Total/NA	Water	8260B SIM	
MB 240-513480/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513480/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159642-H-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159642-M-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513804

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159965-1	TRIP BLANK_105	Total/NA	Water	8260B	
240-159965-2	MW-93S_111021	Total/NA	Water	8260B	
MB 240-513804/6	Method Blank	Total/NA	Water	8260B	
LCS 240-513804/4	Lab Control Sample	Total/NA	Water	8260B	
240-159953-A-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159953-D-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159965-1

Client Sample ID: TRIP BLANK_105

Lab Sample ID: 240-159965-1

Date Collected: 11/10/21 00:00

Matrix: Water

Date Received: 11/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513804	11/19/21 22:22	LEE	TAL CAN

Client Sample ID: MW-93S_111021

Lab Sample ID: 240-159965-2

Date Collected: 11/10/21 14:11

Matrix: Water

Date Received: 11/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513804	11/19/21 22:44	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513480	11/18/21 05:32	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159965-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive Suite 200 / Brighton MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program	Client Project Manager	Site Contact	Lab Contact	COC No:
Company Name: Arcadis	☐ DW ☐ NPDES ☐ RCRA ☐ Other	Kris Hinskey	Julia McClafferty	Mike DelMonico	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500		Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	For lab use only
City/State/Zip: Novi, MI, 48377		Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		Walk-in client
Phone: 248-994-2240		Sampler Name: Gary Schafer	TAT if different from below: 10 day; ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Lab sampling
Project Name: Ford LTP Off-Site		Method of Shipment/Carrier			Job/SDG No
Project Number: 30080642.402.04		Shipping/Tracking No			
PO # 30080642.402.04					

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions
TRIP BLANK_ 105	---	---		X						1					N	G	X	X	X	X	X	X	* (W)	1 Trip Blank
MW-935_111021	11/10/21	14:11		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159965 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments

Submit all results through Cadena at jtomalia@cadenaco.com Cadena #E203631
Level IV Reporting requested

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
Gary Schafer	Arcadis	11/10/21 1726	Novi cold Storage	Arcadis	11/10/21 1726
[illegible]	ARCADIS	11/11/21 0950	[illegible]	ETA	11/11/21 0950
[illegible]	ETA	11-11-21 1042	Received in Laboratory by: [illegible]	ETA	11/12/21 8:00

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11/29/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159965**
Canton Facility

Client Arcadis Site Name

Cooler Received on 11/12/21 Opened on 11/12/21

Cooler unpacked by: Matthew Surna

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT. (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.5 °C Corrected Cooler Temp. 0.6 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# **HC157842**
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #____ (Yes) No
17. Was a LL Hg or Me Hg trip blank present? ____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

NO SIM on TB per Corrected COC. Date 11/12/21

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

WI-NC-099

DATA VERIFICATION REPORT

November 29, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159965-1
Sample date: 2021-11-10
Report received by CADENA: 2021-11-29
Initial Data Verification completed by CADENA: 2021-11-29
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 513804 LCS recovery was outlying biased high for the following analyte: TETRACHLOROETHENE. Associated client sample results were non-detect so qualification was not required based on this high bias QC outlier.

GCMS VOC QC batch CCV response outliers as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159965-1

		Sample Name:	TRIP BLANK_105				MW-93S_111021			
		Lab Sample ID:	2401599651				2401599652			
		Sample Date:	11/10/2021				11/10/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

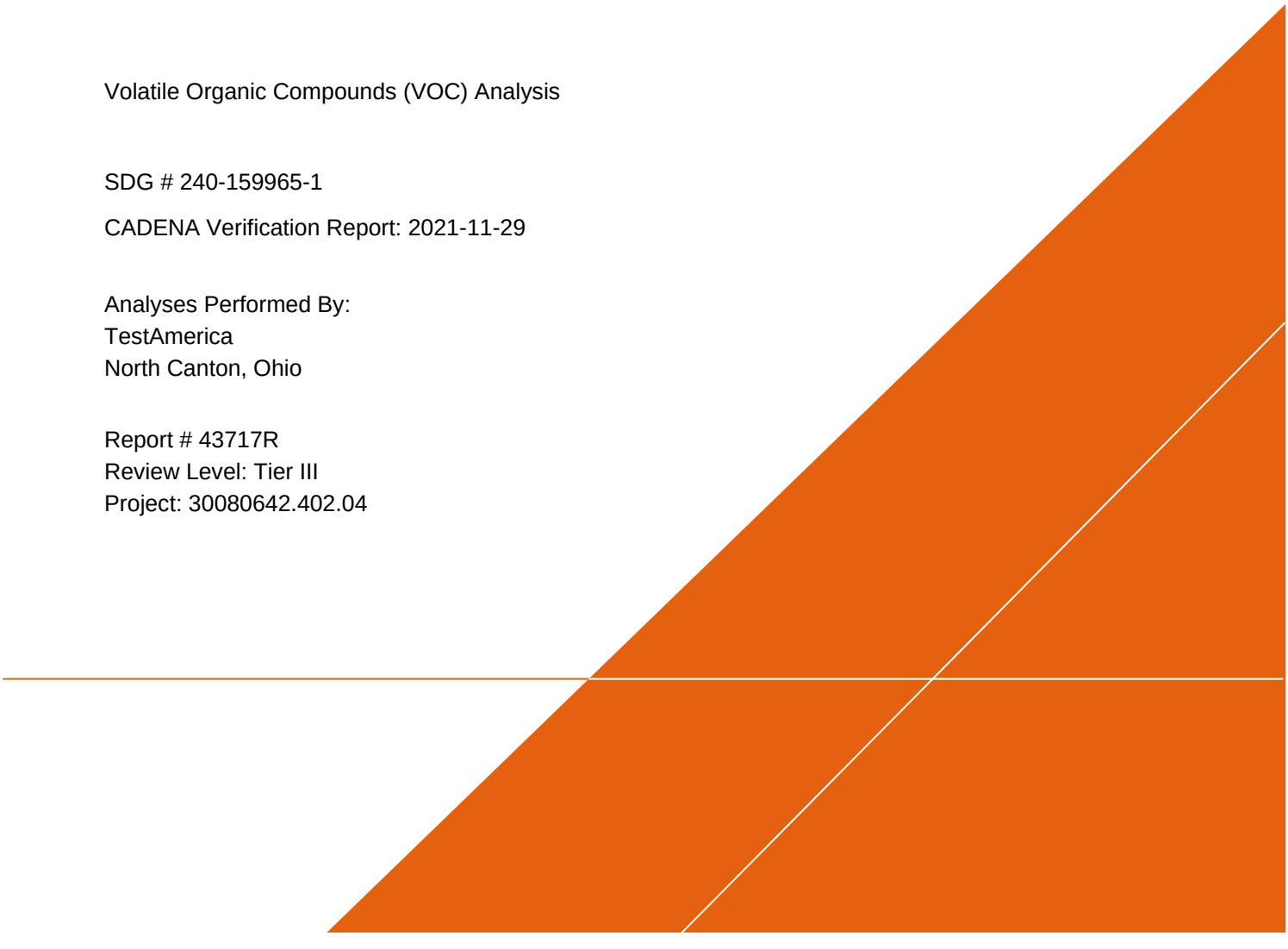
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159965-1

CADENA Verification Report: 2021-11-29

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43717R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159965-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_105	240-159965-1	Water	11/10/21		X	
MW-93S_111021	240-159965-2	Water	11/10/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Compound	Criteria
TRIP BLANK_105 MW-93S_111021	Continuous Calibration Verification %D	Vinyl chloride	+30.0%
		cis-1,2-Dichloroethene	+20.5%
		Tetrachloroethene	+21.1%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J

Initial/Continuing	Criteria	Sample Result	Qualification
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive Suite 200 / Brighton MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program	Client Project Manager	Site Contact	Lab Contact	COC No:
Company Name: Arcadis	☐ DW ☐ NPDES ☐ RCRA ☐ Other	Kris Hinskey	Julia McClafferty	Mike DelMonico	
Address: 28550 Cabot Drive, Suite 500		Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377		Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240		Sampler Name: Gary Schafer	TAT if different from below: 10 day; ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client
Project Name: Ford LTP Off-Site		Method of Shipment/Carrier			Lab sampling
Project Number: 30080642.402.04		Shipping/Tracking No			Job/SDG No
PO # 30080642.402.04					

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac/ NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions
TRIP BLANK_ 105	---	---		X						1					N	G	X	X	X	X	X	X	X (W)	1 Trip Blank
MW-935_111021	11/10/21	14:11		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159965 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco com Cadena #E203631
Level IV Reporting requested

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
Gary Schafer	Arcadis	11/10/21 1726	Novi Cold Storage	Arcadis	11/10/21 1726
[illegible]	ARCADIS	11/11/21 0950	[illegible]	ETA	11/11/21 0950
Jeni Hall	ETA	11-11-21 1042	Received in Laboratory by: M. A.	Company: ETA	Date/Time: 11/12/21 8:00

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Client Sample ID: TRIP BLANK_105
Lab Sample ID: 240-159965-1

Date Collected: 11/10/21 00:00
Matrix: Water
Date Received: 11/12/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 22:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 22:22	1
Tetrachloroethene	1.0	U *+	1.0	0.44	ug/L			11/19/21 22:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 22:22	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 22:22	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 22:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*62 - 137*		*11/19/21 22:22*	*1*
4-Bromofluorobenzene (Surr)	*75*		*56 - 136*		*11/19/21 22:22*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/19/21 22:22*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/19/21 22:22*	*1*

Client Sample ID: MW-93S_111021
Lab Sample ID: 240-159965-2

Date Collected: 11/10/21 14:11
Matrix: Water
Date Received: 11/12/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 05:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*66 - 120*		*11/18/21 05:32*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 22:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 22:44	1
Tetrachloroethene	1.0	U *+	1.0	0.44	ug/L			11/19/21 22:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 22:44	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 22:44	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 22:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*62 - 137*		*11/19/21 22:44*	*1*
4-Bromofluorobenzene (Surr)	*72*		*56 - 136*		*11/19/21 22:44*	*1*
Toluene-d8 (Surr)	*120*		*78 - 122*		*11/19/21 22:44*	*1*
Dibromofluoromethane (Surr)	*104*		*73 - 120*		*11/19/21 22:44*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159961-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/29/2021 8:36:57 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159961-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159961-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159961-1

Comments
No additional comments.

Receipt
The samples were received on 11/12/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.6º C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) associated with batch 513804 recovered above the upper control limit for Vinyl Chloride. The samples associated with this CCV were non-detect for the affected analyte; therefore, the data have been reported. The associated samples are impacted: TRIP BLANK_116 (240-159961-1) and MW-176S_111021 (240-159961-2).

Method 8260B: The laboratory control sample (LCS) for 513804 recovered outside control limits for Tetrachloroethene. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159961-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159961-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159961-1	TRIP BLANK_116	Water	11/10/21 00:00	11/12/21 08:00
240-159961-2	MW-176S_111021	Water	11/10/21 15:16	11/12/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159961-1

Client Sample ID: TRIP BLANK_116 — Lab Sample ID: 240-159961-1

No Detections.

Client Sample ID: MW-176S_111021 — Lab Sample ID: 240-159961-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159961-1

Client Sample ID: TRIP BLANK_116
Date Collected: 11/10/21 00:00
Date Received: 11/12/21 08:00

Lab Sample ID: 240-159961-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 20:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 20:07	1
Tetrachloroethene	1.0	U *+	1.0	0.44	ug/L			11/19/21 20:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 20:07	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 20:07	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 20:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*62 - 137*		*11/19/21 20:07*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/19/21 20:07*	*1*
Toluene-d8 (Surr)	*107*		*78 - 122*		*11/19/21 20:07*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/19/21 20:07*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159961-1

Client Sample ID: MW-176S_111021
Date Collected: 11/10/21 15:16
Date Received: 11/12/21 08:00

Lab Sample ID: 240-159961-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 04:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*		*11/18/21 04:20*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 20:29	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 20:29	1
Tetrachloroethene	1.0	U *+	1.0	0.44	ug/L			11/19/21 20:29	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 20:29	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 20:29	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 20:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*		*11/19/21 20:29*	*1*
4-Bromofluorobenzene (Surr)	*69*		*56 - 136*		*11/19/21 20:29*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/19/21 20:29*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/19/21 20:29*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159961-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159953-A-2 MS	Matrix Spike	100	85	115	96
240-159953-D-2 MSD	Matrix Spike Duplicate	99	87	112	92
240-159961-1	TRIP BLANK_116	101	70	107	94
240-159961-2	MW-176S_111021	102	69	108	94
LCS 240-513804/4	Lab Control Sample	100	87	118	98
MB 240-513804/6	Method Blank	105	81	118	101

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159642-H-3 MS	Matrix Spike	87
240-159642-M-3 MSD	Matrix Spike Duplicate	87
240-159961-2	MW-176S_111021	87
LCS 240-513480/3	Lab Control Sample	84
MB 240-513480/4	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513804/6
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 15:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 15:38	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 15:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 15:38	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 15:38	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 15:38	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/19/21 15:38*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/19/21 15:38*	*1*
Toluene-d8 (Surr)	*118*		*78 - 122*		*11/19/21 15:38*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/19/21 15:38*	*1*

Lab Sample ID: LCS 240-513804/4
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	11.0		ug/L		110	63 - 134
cis-1,2-Dichloroethene	10.0	11.0		ug/L		110	77 - 123
Tetrachloroethene	10.0	13.0	*+	ug/L		130	76 - 123
trans-1,2-Dichloroethene	10.0	10.8		ug/L		108	75 - 124
Trichloroethene	10.0	9.54		ug/L		95	70 - 122
Vinyl chloride	10.0	11.1		ug/L		111	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*118*		*78 - 122*
Dibromofluoromethane (Surr)	*98*		*73 - 120*

Lab Sample ID: 240-159953-A-2 MS
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	10.3		ug/L		103	66 - 128
Tetrachloroethene	1.0	U *+	10.0	10.2		ug/L		102	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	56 - 136
Trichloroethene	1.0	U	10.0	8.59		ug/L		86	61 - 124
Vinyl chloride	1.0	U	10.0	10.2		ug/L		102	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*
Toluene-d8 (Surr)	*115*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159953-A-2 MS
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*96*		*73 - 120*

Lab Sample ID: 240-159953-D-2 MSD
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.86		ug/L		99	56 - 135	5	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.79		ug/L		98	66 - 128	5	14
Tetrachloroethene	1.0	U *+	10.0	9.63		ug/L		96	62 - 131	6	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.82		ug/L		98	56 - 136	5	15
Trichloroethene	1.0	U	10.0	8.28		ug/L		83	61 - 124	4	15
Vinyl chloride	1.0	U	10.0	10.7		ug/L		107	43 - 157	5	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*112*		*78 - 122*
Dibromofluoromethane (Surr)	*92*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513480/4
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 19:58	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/17/21 19:58*	*1*

Lab Sample ID: LCS 240-513480/3
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.37		ug/L		94	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*

Lab Sample ID: 240-159642-H-3 MS
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.3		ug/L		103	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

Lab Sample ID: 240-159642-M-3 MSD
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.57		ug/L		96	51 - 153	7	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159961-1

GC/MS VOA

Analysis Batch: 513480

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159961-2	MW-176S_111021	Total/NA	Water	8260B SIM	
MB 240-513480/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513480/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159642-H-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159642-M-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513804

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159961-1	TRIP BLANK_116	Total/NA	Water	8260B	
240-159961-2	MW-176S_111021	Total/NA	Water	8260B	
MB 240-513804/6	Method Blank	Total/NA	Water	8260B	
LCS 240-513804/4	Lab Control Sample	Total/NA	Water	8260B	
240-159953-A-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159953-D-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159961-1

Client Sample ID: TRIP BLANK_116

Lab Sample ID: 240-159961-1

Date Collected: 11/10/21 00:00

Matrix: Water

Date Received: 11/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513804	11/19/21 20:07	LEE	TAL CAN

Client Sample ID: MW-176S_111021

Lab Sample ID: 240-159961-2

Date Collected: 11/10/21 15:16

Matrix: Water

Date Received: 11/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513804	11/19/21 20:29	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513480	11/18/21 04:20	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159961-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratories, Inc.

TestAmerica Laboratory location: Brighton — 10448 Citation Drive Suite 200 / Brighton MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Gary Schafer	TAT if different from below: 10 day; ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions.
TRIP BLANK_ 116	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1765-111021	11/10/21	15 16		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159961 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco com Cadena #E203631
Level IV Reporting requested

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
Gary Schafer	Arcadis	11/10/21 1728	Novi cold Storage	Arcadis	11/10/21 1728
Relinquished by	Company	Date/Time	Received by	Company	Date/Time
[illegible]	ARCADIS	11/11/21 / 0950	[illegible]	ETA	11/11/21 0950
Relinquished by	Company	Date/Time	Received in Laboratory by	Company	Date/Time
[illegible]	ETA	11-11-21 1042	[illegible]	ETA	11/12/21 8.00

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11/29/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159962**
Canton Facility

Client Arcadis Site Name

Cooler Received on 11/12/21 Opened on 11/12/21

Cooler unpacked by: Matthew Surma

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1 Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.5 °C Corrected Cooler Temp. 0.6 °C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2 Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	~~No~~ M.D.B.
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?	(Y)	(Y) (Y)
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No	(NA) pH Strip Lot# HC157842
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ____	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

No SIM on TB per Corrected COC. DMR 11/12/21

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.

Sample(s) ____ were received in a broken container.

Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.

Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

WI-NC-099

DATA VERIFICATION REPORT

November 29, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159961-1
Sample date: 2021-11-10
Report received by CADENA: 2021-11-29
Initial Data Verification completed by CADENA: 2021-11-29
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 513804 LCS recovery was outlying biased high for the following analyte: TETRACHLOROETHENE. Associated client sample results were non-detect so qualification was not required based on this high bias QC outlier.

GCMS VOC QC batch CCV response outliers as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159961-1

		Sample Name:	TRIP BLANK_116				MW-176S_111021			
		Lab Sample ID:	2401599611				2401599612			
		Sample Date:	11/10/2021				11/10/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

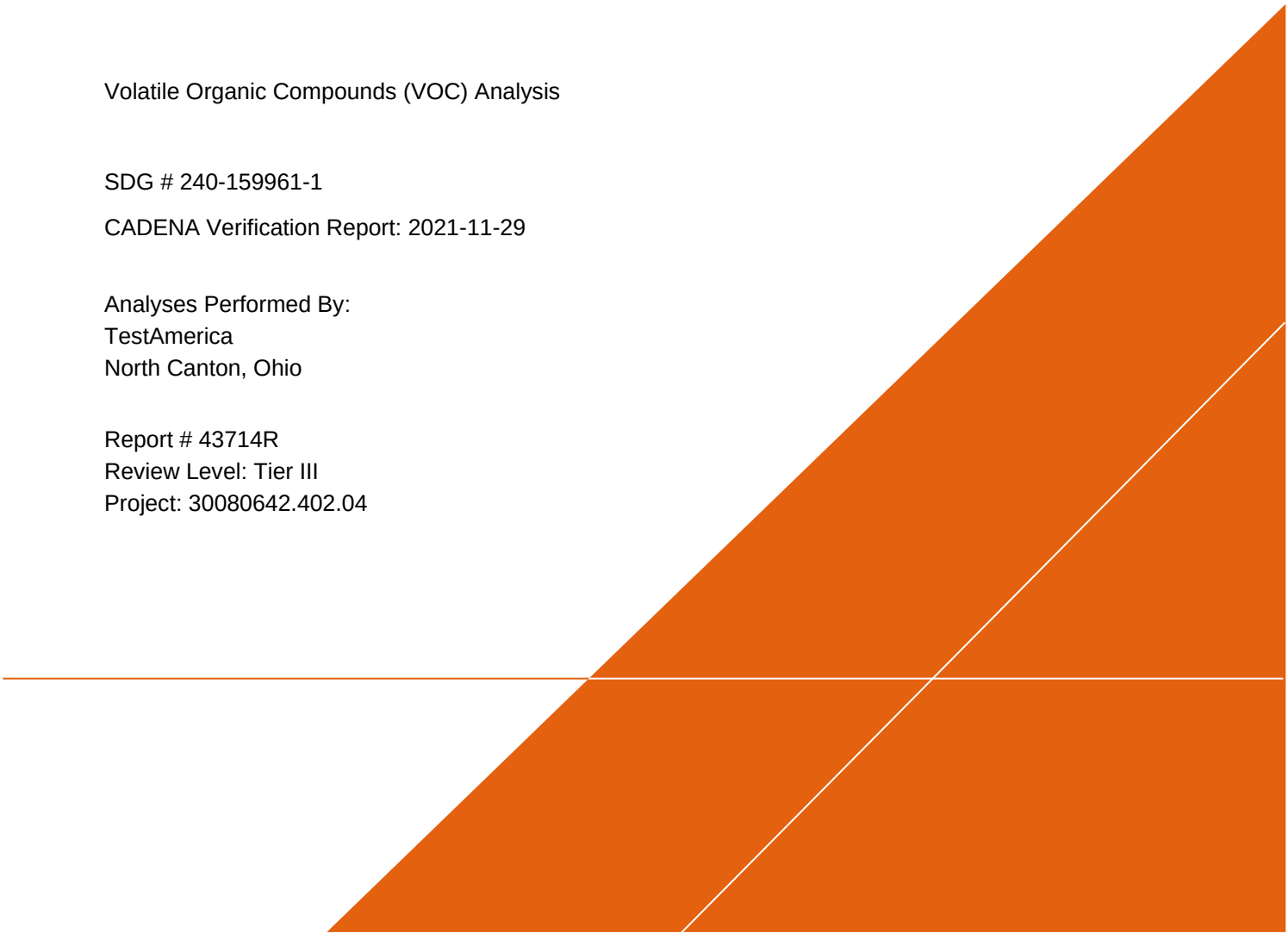
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159961-1

CADENA Verification Report: 2021-11-29

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43714R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159961-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_116	240-159961-1	Water	11/10/21		X	
MW-176S_111021	240-159961-2	Water	11/10/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Compound	Criteria
TRIP BLANK_116 MW-176S_111021	Continuous Calibration Verification %D	Vinyl chloride	+30.0%
		cis-1,2-Dichloroethene	+20.5%
		Tetrachloroethene	+21.1%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J

Initial/Continuing	Criteria	Sample Result	Qualification
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive Suite 200 / Brighton MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: 10 day; ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client; Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier			Job/SDG No
Project Number: 30080642.402.04	Shipping/Tracking No:			
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions.
TRIP BLANK_ 116	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-176S-111021	11/10/21	1516		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159961 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco com Cadena #E203631
Level IV Reporting requested

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
Gary Schafer	Arcadis	11/10/21 1728	Novi cold Storage	Arcadis	11/10/21 1728
Christopher Allen	ARCADIS	11/11/21 / 0950	Jen Hall	ETA	11/11/21 0950
Jen Hall	ETA	11-11-21 1042	Received in Laboratory by: M. A.	Company: ETA	Date/Time: 11/12/21 8.00

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11/29/2021

Client Sample ID: TRIP BLANK_116
Lab Sample ID: 240-159961-1

Date Collected: 11/10/21 00:00
Matrix: Water
Date Received: 11/12/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 20:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 20:07	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 20:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 20:07	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 20:07	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 20:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*62 - 137*		*11/19/21 20:07*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/19/21 20:07*	*1*
Toluene-d8 (Surr)	*107*		*78 - 122*		*11/19/21 20:07*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/19/21 20:07*	*1*

Client Sample ID: MW-176S_111021
Lab Sample ID: 240-159961-2

Date Collected: 11/10/21 15:16
Matrix: Water
Date Received: 11/12/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 04:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*		*11/18/21 04:20*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 20:29	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 20:29	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 20:29	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 20:29	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 20:29	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 20:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*		*11/19/21 20:29*	*1*
4-Bromofluorobenzene (Surr)	*69*		*56 - 136*		*11/19/21 20:29*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/19/21 20:29*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/19/21 20:29*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159726-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/24/2021 8:33:16 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159726-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159726-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159726-1

Comments
No additional comments.

Receipt
The samples were received on 11/10/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 0.7º C and 0.8º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159726-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159726-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159726-1	TRIP BLANK_87	Water	11/08/21 00:00	11/10/21 08:00
240-159726-2	MW-178S_110821	Water	11/08/21 13:17	11/10/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159726-1

Client Sample ID: TRIP BLANK_87 — Lab Sample ID: 240-159726-1

No Detections.

Client Sample ID: MW-178S_110821 — Lab Sample ID: 240-159726-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159726-1

Client Sample ID: TRIP BLANK_87

Date Collected: 11/08/21 00:00
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159726-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 21:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 21:46	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 21:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 21:46	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 21:46	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 21:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*62 - 137*		*11/17/21 21:46*	*1*
4-Bromofluorobenzene (Surr)	*83*		*56 - 136*		*11/17/21 21:46*	*1*
Toluene-d8 (Surr)	*91*		*78 - 122*		*11/17/21 21:46*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/17/21 21:46*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159726-1

Client Sample ID: MW-178S_110821
Date Collected: 11/08/21 13:17
Date Received: 11/10/21 08:00

Lab Sample ID: 240-159726-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 22:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*66 - 120*		*11/17/21 22:22*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 22:36	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 22:36	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 22:36	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 22:36	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 22:36	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 22:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/17/21 22:36*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/17/21 22:36*	*1*
Toluene-d8 (Surr)	*93*		*78 - 122*		*11/17/21 22:36*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/17/21 22:36*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159726-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159660-B-9 MS	Matrix Spike	85	89	92	93
240-159660-B-9 MSD	Matrix Spike Duplicate	84	91	95	94
240-159726-1	TRIP BLANK_87	91	83	91	100
240-159726-2	MW-178S_110821	93	82	93	99
LCS 240-513432/5	Lab Control Sample	87	89	95	93
MB 240-513432/8	Method Blank	93	83	92	100

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159642-H-3 MS	Matrix Spike	87
240-159642-M-3 MSD	Matrix Spike Duplicate	87
240-159726-2	MW-178S_110821	86
LCS 240-513480/3	Lab Control Sample	84
MB 240-513480/4	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513432/8
Matrix: Water
Analysis Batch: 513432

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 14:39	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 14:39	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 14:39	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 14:39	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 14:39	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 14:39	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/17/21 14:39*	*1*
4-Bromofluorobenzene (Surr)	*83*		*56 - 136*		*11/17/21 14:39*	*1*
Toluene-d8 (Surr)	*92*		*78 - 122*		*11/17/21 14:39*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/17/21 14:39*	*1*

Lab Sample ID: LCS 240-513432/5
Matrix: Water
Analysis Batch: 513432

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	26.2		ug/L		105	63 - 134
cis-1,2-Dichloroethene	25.0	25.5		ug/L		102	77 - 123
Tetrachloroethene	25.0	26.7		ug/L		107	76 - 123
trans-1,2-Dichloroethene	25.0	25.8		ug/L		103	75 - 124
Trichloroethene	25.0	25.8		ug/L		103	70 - 122
Vinyl chloride	25.0	31.0		ug/L		124	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*87*		*62 - 137*
4-Bromofluorobenzene (Surr)	*89*		*56 - 136*
Toluene-d8 (Surr)	*95*		*78 - 122*
Dibromofluoromethane (Surr)	*93*		*73 - 120*

Lab Sample ID: 240-159660-B-9 MS
Matrix: Water
Analysis Batch: 513432

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10	U	250	253		ug/L		101	56 - 135
cis-1,2-Dichloroethene	280		250	534		ug/L		101	66 - 128
Tetrachloroethene	10	U	250	293		ug/L		117	62 - 131
trans-1,2-Dichloroethene	10	U	250	255		ug/L		102	56 - 136
Trichloroethene	180		250	447		ug/L		105	61 - 124
Vinyl chloride	10	U	250	190		ug/L		76	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*62 - 137*
4-Bromofluorobenzene (Surr)	*89*		*56 - 136*
Toluene-d8 (Surr)	*92*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159660-B-9 MS
Matrix: Water
Analysis Batch: 513432

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*93*		*73 - 120*

Lab Sample ID: 240-159660-B-9 MSD
Matrix: Water
Analysis Batch: 513432

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	10	U	250	263		ug/L		105	56 - 135	4	26
cis-1,2-Dichloroethene	280		250	506		ug/L		90	66 - 128	5	14
Tetrachloroethene	10	U	250	291		ug/L		116	62 - 131	1	20
trans-1,2-Dichloroethene	10	U	250	245		ug/L		98	56 - 136	4	15
Trichloroethene	180		250	433		ug/L		100	61 - 124	3	15
Vinyl chloride	10	U	250	184		ug/L		74	43 - 157	3	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*62 - 137*
4-Bromofluorobenzene (Surr)	*91*		*56 - 136*
Toluene-d8 (Surr)	*95*		*78 - 122*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513480/4
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 19:58	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/17/21 19:58*	*1*

Lab Sample ID: LCS 240-513480/3
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.37		ug/L		94	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*

Lab Sample ID: 240-159642-H-3 MS
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.3		ug/L		103	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

Lab Sample ID: 240-159642-M-3 MSD
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.57		ug/L		96	51 - 153	7	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159726-1

GC/MS VOA

Analysis Batch: 513432

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159726-1	TRIP BLANK_87	Total/NA	Water	8260B	
240-159726-2	MW-178S_110821	Total/NA	Water	8260B	
MB 240-513432/8	Method Blank	Total/NA	Water	8260B	
LCS 240-513432/5	Lab Control Sample	Total/NA	Water	8260B	
240-159660-B-9 MS	Matrix Spike	Total/NA	Water	8260B	
240-159660-B-9 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 513480

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159726-2	MW-178S_110821	Total/NA	Water	8260B SIM	
MB 240-513480/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513480/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159642-H-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159642-M-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159726-1

Client Sample ID: TRIP BLANK_87

Lab Sample ID: 240-159726-1

Date Collected: 11/08/21 00:00

Matrix: Water

Date Received: 11/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513432	11/17/21 21:46	SAM	TAL CAN

Client Sample ID: MW-178S_110821

Lab Sample ID: 240-159726-2

Date Collected: 11/08/21 13:17

Matrix: Water

Date Received: 11/10/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513432	11/17/21 22:36	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	513480	11/17/21 22:22	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159726-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Andrew Banitt		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30080642.402.04	Shipping/Tracking No:		
PO # 30080642.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below: 10 day ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day

Analyses

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 87	---	---		X						1					N	G	X	X	X	X	X	X	~~X~~	1 Trip Blank
MW-1785_110821	11/8/21	1317		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159726 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	11/8/21 1630	Novi Cold storage	Arcadis	11/8/21 1630
[signature]	ARCADIS	11/9/21 / 1040	[signature]	ETA	11/9/21 1040
[signature]	ETA	11/9/21 1055	Mandolyn Bloch	exn	11-10-21 8:00

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159126**
Canton Facility

Client Arcadis Site Name

Cooler Received on 11-10-21 Opened on 11-10-21

Cooler unpacked by: Marilyn Beaver

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: ~~Bubble Wrap~~ Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity_____	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC157842
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #_____	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

no SIM on TB per Corrected COC. JMZ 11/10/21

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

Login # : 159726

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form				
Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
TA Client Box Other	IR-14 IR-15	0-6	0-7	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15	0-7	0-8	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15	

DATA VERIFICATION REPORT

November 25, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159726-1
Sample date: 2021-11-08
Report received by CADENA: 2021-11-24
Initial Data Verification completed by CADENA: 2021-11-25
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159726-1

		Sample Name:	TRIP BLANK_87				MW-178S_110821			
		Lab Sample ID:	2401597261				2401597262			
		Sample Date:	11/8/2021				11/8/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

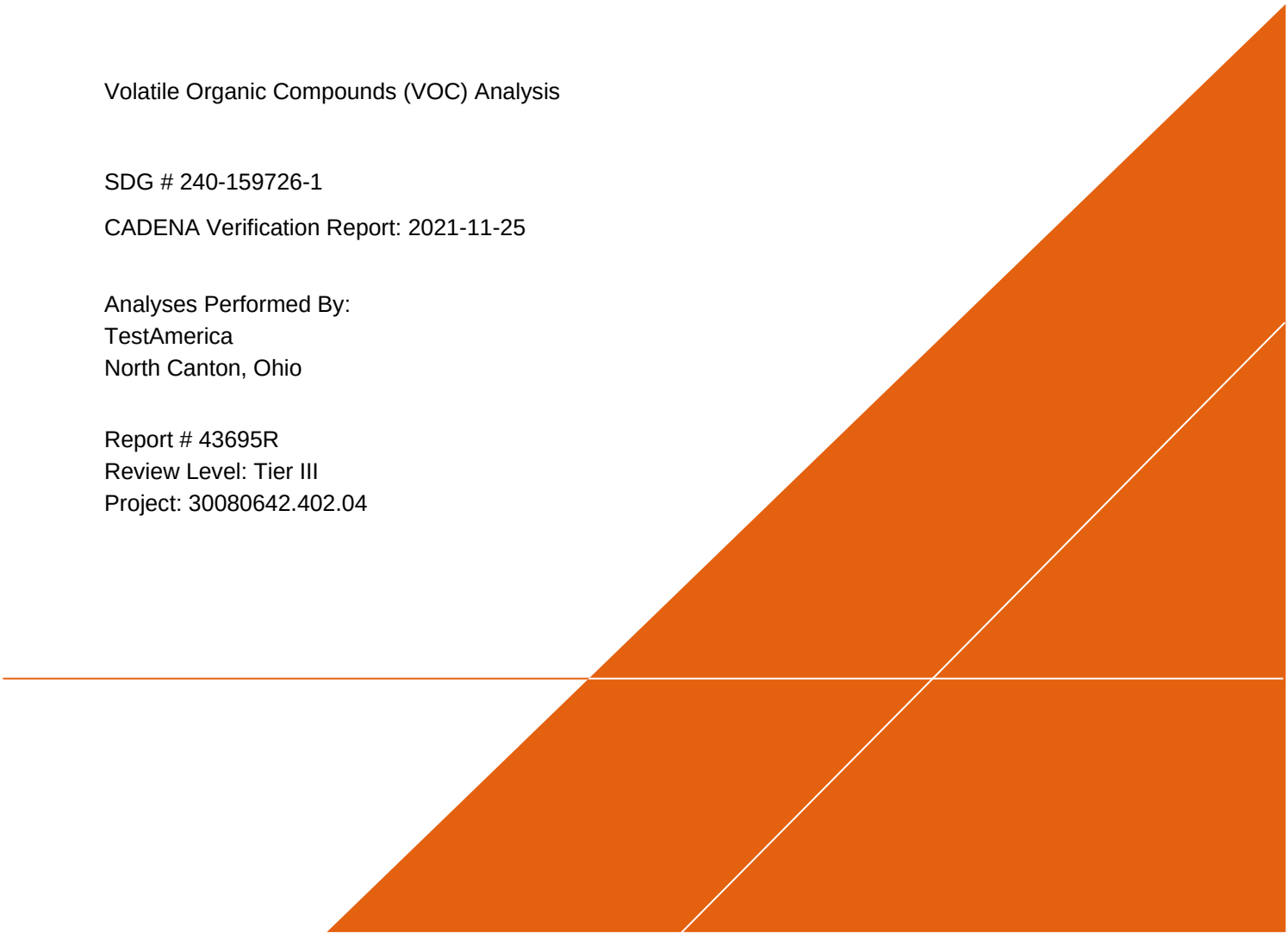
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159726-1

CADENA Verification Report: 2021-11-25

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43695R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159726-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_87	240-159726-1	Water	11/08/21		X	
MW-178S_110821	240-159726-2	Water	11/08/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 13, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN
190

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Andrew Banitt		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30080642.402.04	Shipping/Tracking No:		
PO # 30080642.402.04			

COC No:

1 of 1 COCs

For lab use only
Walk-in client
Lab sampling
Job/SDG No:

Analysis Turnaround Time
TAT if different from below
10 day
☐ 3 weeks
☑ 2 weeks
☐ 1 week
☐ 2 days
☐ 1 day

Sample Identification	Sample Date	Sample Time	Matrix: Air	Matrix: Aqueous	Matrix: Sediment	Matrix: Solid	Matrix: Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM					Sample Specific Notes / Special Instructions:
TRIP BLANK_ 87	---	---		X						1					N	G	X	X	X	X	X	X	~~X~~ CW					1 Trip Blank
MW-1785_110821	11/8/21	1317		X						6					N	G	X	X	X	X	X	X	X					3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159726 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Andrew Banitt	Arcadis	11/8/21 1630	Novi Cold storage	Arcadis	11/8/21 1630
Christine [illegible]	ARCADIS	11/9/21 / 1040	Teri Hall	ETA	11/9/21 1040
Teri Hall	ETA	11/9/21 1055	Received in Laboratory by: Mandolyn Block	exn	11-10-21 8:00

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Client Sample ID: TRIP BLANK_87
Lab Sample ID: 240-159726-1
Date Collected: 11/08/21 00:00
Matrix: Water
Date Received: 11/10/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 21:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 21:46	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 21:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 21:46	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 21:46	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 21:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*62 - 137*		*11/17/21 21:46*	*1*
4-Bromofluorobenzene (Surr)	*83*		*56 - 136*		*11/17/21 21:46*	*1*
Toluene-d8 (Surr)	*91*		*78 - 122*		*11/17/21 21:46*	*1*
Dibromofluoromethane (Surr)	*100*		*73 - 120*		*11/17/21 21:46*	*1*

Client Sample ID: MW-178S_110821
Lab Sample ID: 240-159726-2
Date Collected: 11/08/21 13:17
Matrix: Water
Date Received: 11/10/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 22:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*66 - 120*		*11/17/21 22:22*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 22:36	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 22:36	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 22:36	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 22:36	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 22:36	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 22:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/17/21 22:36*	*1*
4-Bromofluorobenzene (Surr)	*82*		*56 - 136*		*11/17/21 22:36*	*1*
Toluene-d8 (Surr)	*93*		*78 - 122*		*11/17/21 22:36*	*1*
Dibromofluoromethane (Surr)	*99*		*73 - 120*		*11/17/21 22:36*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159962-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/29/2021 8:40:33 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159962-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159962-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159962-1

Comments
No additional comments.

Receipt
The samples were received on 11/12/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.6º C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) associated with batch 513804 recovered above the upper control limit for Vinyl Chloride. The samples associated with this CCV were non-detect for the affected analyte; therefore, the data have been reported. The associated samples are impacted: TRIP BLANK_107 (240-159962-1) and MW-174S_111021 (240-159962-2).

Method 8260B: The laboratory control sample (LCS) for 513804 recovered outside control limits for Tetrachloroethene. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159962-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159962-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159962-1	TRIP BLANK_107	Water	11/10/21 00:00	11/12/21 08:00
240-159962-2	MW-174S_111021	Water	11/10/21 10:21	11/12/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159962-1

Client Sample ID: TRIP BLANK_107 — Lab Sample ID: 240-159962-1

No Detections.

Client Sample ID: MW-174S_111021 — Lab Sample ID: 240-159962-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159962-1

Client Sample ID: TRIP BLANK_107
Date Collected: 11/10/21 00:00
Date Received: 11/12/21 08:00

Lab Sample ID: 240-159962-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 20:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 20:52	1
Tetrachloroethene	1.0	U *+	1.0	0.44	ug/L			11/19/21 20:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 20:52	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 20:52	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 20:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*62 - 137*		*11/19/21 20:52*	*1*
4-Bromofluorobenzene (Surr)	*74*		*56 - 136*		*11/19/21 20:52*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/19/21 20:52*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/19/21 20:52*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159962-1

Client Sample ID: MW-174S_111021
Date Collected: 11/10/21 10:21
Date Received: 11/12/21 08:00

Lab Sample ID: 240-159962-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 04:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*66 - 120*		*11/18/21 04:44*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 21:14	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 21:14	1
Tetrachloroethene	1.0	U *+	1.0	0.44	ug/L			11/19/21 21:14	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 21:14	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 21:14	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 21:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*		*11/19/21 21:14*	*1*
4-Bromofluorobenzene (Surr)	*71*		*56 - 136*		*11/19/21 21:14*	*1*
Toluene-d8 (Surr)	*107*		*78 - 122*		*11/19/21 21:14*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/19/21 21:14*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159962-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159953-A-2 MS	Matrix Spike	100	85	115	96
240-159953-D-2 MSD	Matrix Spike Duplicate	99	87	112	92
240-159962-1	TRIP BLANK_107	101	74	108	96
240-159962-2	MW-174S_111021	100	71	107	96
LCS 240-513804/4	Lab Control Sample	100	87	118	98
MB 240-513804/6	Method Blank	105	81	118	101

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159642-H-3 MS	Matrix Spike	87
240-159642-M-3 MSD	Matrix Spike Duplicate	87
240-159962-2	MW-174S_111021	86
LCS 240-513480/3	Lab Control Sample	84
MB 240-513480/4	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513804/6
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 15:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 15:38	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 15:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 15:38	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 15:38	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 15:38	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*		*11/19/21 15:38*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/19/21 15:38*	*1*
Toluene-d8 (Surr)	*118*		*78 - 122*		*11/19/21 15:38*	*1*
Dibromofluoromethane (Surr)	*101*		*73 - 120*		*11/19/21 15:38*	*1*

Lab Sample ID: LCS 240-513804/4
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	11.0		ug/L		110	63 - 134
cis-1,2-Dichloroethene	10.0	11.0		ug/L		110	77 - 123
Tetrachloroethene	10.0	13.0	*+	ug/L		130	76 - 123
trans-1,2-Dichloroethene	10.0	10.8		ug/L		108	75 - 124
Trichloroethene	10.0	9.54		ug/L		95	70 - 122
Vinyl chloride	10.0	11.1		ug/L		111	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*118*		*78 - 122*
Dibromofluoromethane (Surr)	*98*		*73 - 120*

Lab Sample ID: 240-159953-A-2 MS
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	10.3		ug/L		103	66 - 128
Tetrachloroethene	1.0	U *+	10.0	10.2		ug/L		102	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	56 - 136
Trichloroethene	1.0	U	10.0	8.59		ug/L		86	61 - 124
Vinyl chloride	1.0	U	10.0	10.2		ug/L		102	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*85*		*56 - 136*
Toluene-d8 (Surr)	*115*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159953-A-2 MS
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*96*		*73 - 120*

Lab Sample ID: 240-159953-D-2 MSD
Matrix: Water
Analysis Batch: 513804

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.86		ug/L		99	56 - 135	5	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.79		ug/L		98	66 - 128	5	14
Tetrachloroethene	1.0	U *+	10.0	9.63		ug/L		96	62 - 131	6	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.82		ug/L		98	56 - 136	5	15
Trichloroethene	1.0	U	10.0	8.28		ug/L		83	61 - 124	4	15
Vinyl chloride	1.0	U	10.0	10.7		ug/L		107	43 - 157	5	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*112*		*78 - 122*
Dibromofluoromethane (Surr)	*92*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513480/4
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 19:58	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/17/21 19:58*	*1*

Lab Sample ID: LCS 240-513480/3
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.37		ug/L		94	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*

Lab Sample ID: 240-159642-H-3 MS
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	10.3		ug/L		103	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

Lab Sample ID: 240-159642-M-3 MSD
Matrix: Water
Analysis Batch: 513480

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.57		ug/L		96	51 - 153	7	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*87*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159962-1

GC/MS VOA

Analysis Batch: 513480

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159962-2	MW-174S_111021	Total/NA	Water	8260B SIM	
MB 240-513480/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513480/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159642-H-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159642-M-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513804

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159962-1	TRIP BLANK_107	Total/NA	Water	8260B	
240-159962-2	MW-174S_111021	Total/NA	Water	8260B	
MB 240-513804/6	Method Blank	Total/NA	Water	8260B	
LCS 240-513804/4	Lab Control Sample	Total/NA	Water	8260B	
240-159953-A-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159953-D-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159962-1

Client Sample ID: TRIP BLANK_107

Lab Sample ID: 240-159962-1

Date Collected: 11/10/21 00:00

Matrix: Water

Date Received: 11/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513804	11/19/21 20:52	LEE	TAL CAN

Client Sample ID: MW-174S_111021

Lab Sample ID: 240-159962-2

Date Collected: 11/10/21 10:21

Matrix: Water

Date Received: 11/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513804	11/19/21 21:14	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513480	11/18/21 04:44	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159962-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN
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Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact
Company Name: Arcadis
Address: 28550 Cabot Drive, Suite 500
City/State/Zip: Novi, MI, 48377
Phone: 248-994-2240
Project Name: Ford LTP Off-Site
Project Number: 30080642.402 04
PO # 30080642.402.04

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

Client Project Manager: Kris Hinskey
Telephone: 248-994-2240
Email: kristoffer hinskey@arcadis.com

Site Contact: Julia McClafferty
Telephone: 734-644-5131

Lab Contact: Mike DelMonico
Telephone: 330-497-9396

Sampler Name: Gary Schafer
Method of Shipment/Carrier:
Shipping/Tracking No:

Analysis Turnaround Time
TAT if different from below
10 day
☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day

COC No: 1 of 1 COCs

For lab use only
Walk-in client
Lab sampling
Job/SDG No

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions.
TRIP BLANK_107	---	---		X						1					N	G	X	X	X	X	X	X	X (W)	1 Trip Blank
MW-1745-111021	11/10/21	10:21		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159962 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ An Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Mo.

Special Instructions/QC Requirements & Comments
Submit all results through Cadena at jtomalia@cadenaco.com Cadena #E203631
Level IV Reporting requested

	Company	Date/Time		Company	Date/Time
Relinquished by: Gary Schafer	Arcadis	11/10/21	1722	Received by: Novi Cold Storage	Arcadis 11/10/21 1722
Relinquished by: [illegible]	ARCADIS	11/10/21	0950	Received by: Jeri Hall	ETA 11/11/21 0950
Relinquished by: Jeri Hall	ETA	11-10-21	1046	Received in Laboratory by: M A.	ETA 11/12/21 8:00

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11/29/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 159962
Canton Facility

Client Arcadis Site Name

Cooler Received on 11/12/21 Opened on 11/12/21

Cooler unpacked by: Matthew Surma

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.5 °C Corrected Cooler Temp. 0.6 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2 Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No	(NA) pH Strip Lot# HC157842
14 Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this	Yes	(No) NA
16 Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present?	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

NO SIM on TB per Corrected COC. 11/12/21

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.

Sample(s) ____ were received in a broken container.

Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory

Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen ____

WI-NC-099

DATA VERIFICATION REPORT

November 29, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159962-1
Sample date: 2021-11-10
Report received by CADENA: 2021-11-29
Initial Data Verification completed by CADENA: 2021-11-29
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 513804 LCS recovery was outlying biased high for the following analyte: TETRACHLOROETHENE. Associated client sample results were non-detect so qualification was not required based on this high bias QC outlier.

GCMS VOC QC batch CCV response outliers as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159962-1

		Sample Name:	TRIP BLANK_107				MW-174S_111021			
		Lab Sample ID:	2401599621				2401599622			
		Sample Date:	11/10/2021				11/10/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

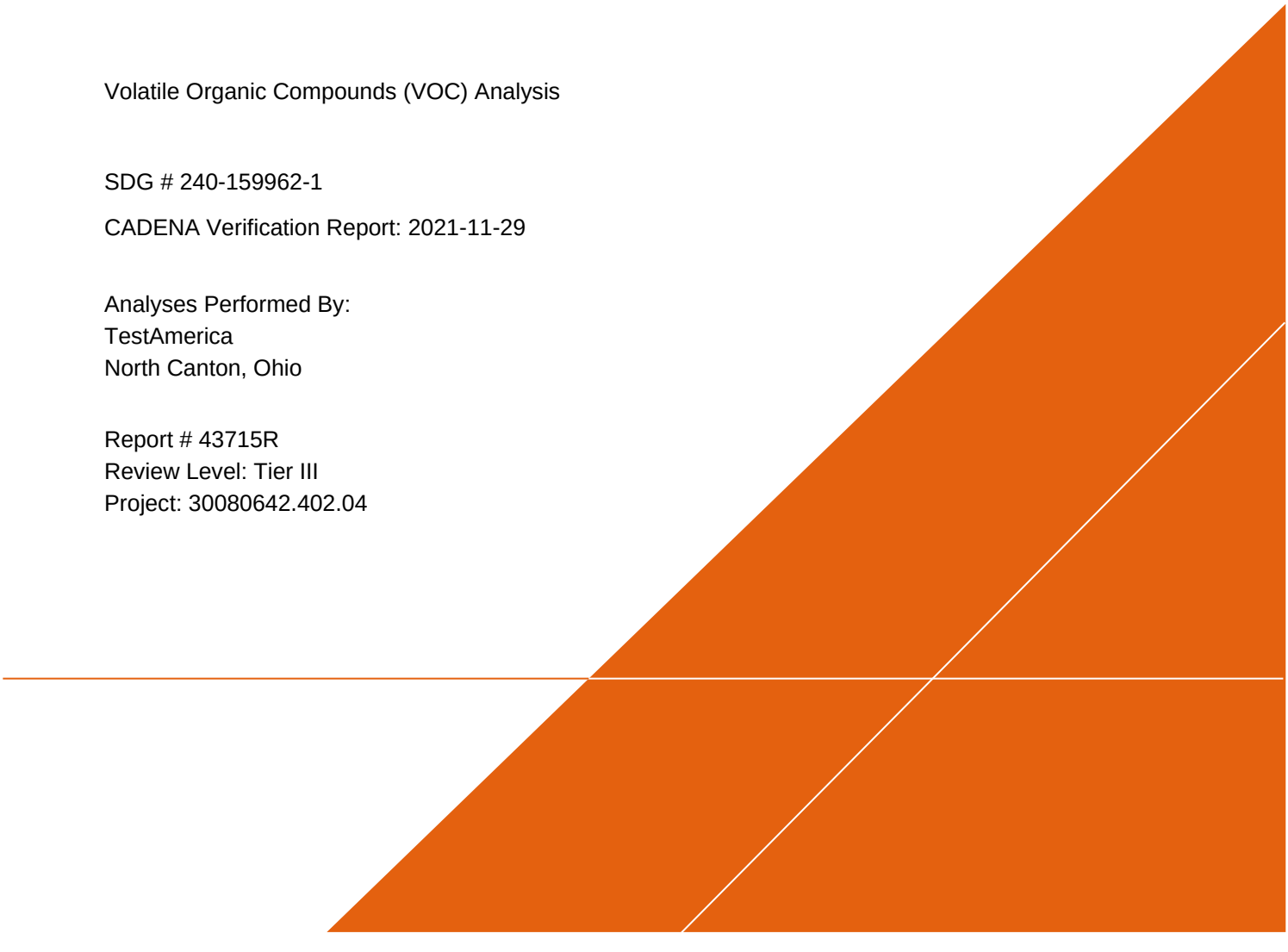
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159962-1

CADENA Verification Report: 2021-11-29

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43715R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159962-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_107	240-159962-1	Water	11/10/21		X	
MW-174S_111021	240-159962-2	Water	11/10/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Compound	Criteria
TRIP BLANK_107 MW-174S_111021	Continuous Calibration Verification %D	Vinyl chloride	+30.0%
		cis-1,2-Dichloroethene	+20.5%
		Tetrachloroethene	+21.1%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J

Initial/Continuing	Criteria	Sample Result	Qualification
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN
190

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No
Project Number: 30080642.402 04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions.
TRIP BLANK_107	---	---		X						1					N	G	X	X	X	X	X	X	(EW)	1 Trip Blank
MW-1745_111021	11/10/21	10:21		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159962 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Mo.

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com Cadena #E203631
Level IV Reporting requested

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
Gary Schafer	Arcadis	11/10/21 1722	Novi Cold Storage	Arcadis	11/10/21 1722
[illegible]	ARCADIS	11/10/21 0950	Jeri Hall	ETA	11/11/21 0950
Jeri Hall	ETA	11-10-21 1046	Received in Laboratory by: M A.	Company: ETA	Date/Time: 11/12/21 8:00

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11/29/2021

Client Sample ID: TRIP BLANK_107
Lab Sample ID: 240-159962-1

Date Collected: 11/10/21 00:00
Matrix: Water
Date Received: 11/12/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 20:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 20:52	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 20:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 20:52	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 20:52	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 20:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*62 - 137*		*11/19/21 20:52*	*1*
4-Bromofluorobenzene (Surr)	*74*		*56 - 136*		*11/19/21 20:52*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/19/21 20:52*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/19/21 20:52*	*1*

Client Sample ID: MW-174S_111021
Lab Sample ID: 240-159962-2

Date Collected: 11/10/21 10:21
Matrix: Water
Date Received: 11/12/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 04:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*66 - 120*		*11/18/21 04:44*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 21:14	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 21:14	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 21:14	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 21:14	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 21:14	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 21:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*		*11/19/21 21:14*	*1*
4-Bromofluorobenzene (Surr)	*71*		*56 - 136*		*11/19/21 21:14*	*1*
Toluene-d8 (Surr)	*107*		*78 - 122*		*11/19/21 21:14*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/19/21 21:14*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159298-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/17/2021 12:40:20 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159298-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159298-1

Job ID: 240-159298-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159298-1

Comments
No additional comments.

Receipt
The samples were received on 11/4/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.0º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159298-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159298-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159298-1	TRIP BLANK_23	Water	11/01/21 00:00	11/04/21 08:00
240-159298-2	MW-177S_110221	Water	11/01/21 11:45	11/04/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159298-1

Client Sample ID: TRIP BLANK_23 — Lab Sample ID: 240-159298-1

No Detections.

Client Sample ID: MW-177S_110221 — Lab Sample ID: 240-159298-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159298-1

Client Sample ID: TRIP BLANK_23

Date Collected: 11/01/21 00:00
Date Received: 11/04/21 08:00

Lab Sample ID: 240-159298-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 14:35	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 14:35	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 14:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 14:35	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 14:35	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 14:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*121*		*62 - 137*		*11/11/21 14:35*	*1*
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*11/11/21 14:35*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/11/21 14:35*	*1*
Dibromofluoromethane (Surr)	*107*		*73 - 120*		*11/11/21 14:35*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159298-1

Client Sample ID: MW-177S_110221
Date Collected: 11/01/21 11:45
Date Received: 11/04/21 08:00

Lab Sample ID: 240-159298-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/09/21 22:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*66 - 120*		*11/09/21 22:48*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 14:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 14:57	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 14:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 14:57	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 14:57	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 14:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*118*		*62 - 137*		*11/11/21 14:57*	*1*
4-Bromofluorobenzene (Surr)	*71*		*56 - 136*		*11/11/21 14:57*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/11/21 14:57*	*1*
Dibromofluoromethane (Surr)	*103*		*73 - 120*		*11/11/21 14:57*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159298-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159298-1	TRIP BLANK_23	121	73	89	107
240-159298-2	MW-177S_110221	118	71	89	103
240-159310-H-2 MS	Matrix Spike	103	98	103	94
240-159310-K-2 MSD	Matrix Spike Duplicate	103	96	102	92
LCS 240-512503/4	Lab Control Sample	102	94	101	93
MB 240-512503/7	Method Blank	114	77	90	98

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159298-2	MW-177S_110221	91
240-159369-D-5 MS	Matrix Spike	92
240-159369-D-5 MSD	Matrix Spike Duplicate	89
LCS 240-512125/4	Lab Control Sample	93
MB 240-512125/5	Method Blank	91

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512503/7
Matrix: Water
Analysis Batch: 512503

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 13:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 13:07	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 13:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 13:07	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 13:07	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 13:07	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*114*		*62 - 137*		*11/11/21 13:07*	*1*
4-Bromofluorobenzene (Surr)	*77*		*56 - 136*		*11/11/21 13:07*	*1*
Toluene-d8 (Surr)	*90*		*78 - 122*		*11/11/21 13:07*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/11/21 13:07*	*1*

Lab Sample ID: LCS 240-512503/4
Matrix: Water
Analysis Batch: 512503

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.54		ug/L		85	63 - 134
cis-1,2-Dichloroethene	10.0	10.9		ug/L		109	77 - 123
Tetrachloroethene	10.0	9.61		ug/L		96	76 - 123
trans-1,2-Dichloroethene	10.0	11.3		ug/L		113	75 - 124
Trichloroethene	10.0	9.58		ug/L		96	70 - 122
Vinyl chloride	10.0	8.69		ug/L		87	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*
Toluene-d8 (Surr)	*101*		*78 - 122*
Dibromofluoromethane (Surr)	*93*		*73 - 120*

Lab Sample ID: 240-159310-H-2 MS
Matrix: Water
Analysis Batch: 512503

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	8.69		ug/L		87	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.70		ug/L		97	66 - 128
Tetrachloroethene	1.0	U	10.0	8.74		ug/L		87	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	10.1		ug/L		101	56 - 136
Trichloroethene	1.0	U	10.0	8.43		ug/L		84	61 - 124
Vinyl chloride	1.0	U	10.0	8.11		ug/L		81	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*
4-Bromofluorobenzene (Surr)	*98*		*56 - 136*
Toluene-d8 (Surr)	*103*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159310-H-2 MS
Matrix: Water
Analysis Batch: 512503

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: 240-159310-K-2 MSD
Matrix: Water
Analysis Batch: 512503

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	8.78		ug/L		88	56 - 135	1	26
cis-1,2-Dichloroethene	1.0	U	10.0	10.0		ug/L		100	66 - 128	3	14
Tetrachloroethene	1.0	U	10.0	8.65		ug/L		86	62 - 131	1	20
trans-1,2-Dichloroethene	1.0	U	10.0	10.2		ug/L		102	56 - 136	1	15
Trichloroethene	1.0	U	10.0	8.58		ug/L		86	61 - 124	2	15
Vinyl chloride	1.0	U	10.0	8.51		ug/L		85	43 - 157	5	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*
4-Bromofluorobenzene (Surr)	*96*		*56 - 136*
Toluene-d8 (Surr)	*102*		*78 - 122*
Dibromofluoromethane (Surr)	*92*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512125/5
Matrix: Water
Analysis Batch: 512125

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/09/21 13:38	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*66 - 120*		*11/09/21 13:38*	*1*

Lab Sample ID: LCS 240-512125/4
Matrix: Water
Analysis Batch: 512125

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.3		ug/L		103	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*66 - 120*

Lab Sample ID: 240-159369-D-5 MS
Matrix: Water
Analysis Batch: 512125

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	9.49		ug/L		95	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*92*		*66 - 120*

Lab Sample ID: 240-159369-D-5 MSD
Matrix: Water
Analysis Batch: 512125

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.5		ug/L		105	51 - 153	11	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*89*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159298-1

GC/MS VOA

Analysis Batch: 512125

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159298-2	MW-177S_110221	Total/NA	Water	8260B SIM	
MB 240-512125/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512125/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159369-D-5 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159369-D-5 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 512503

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159298-1	TRIP BLANK_23	Total/NA	Water	8260B	
240-159298-2	MW-177S_110221	Total/NA	Water	8260B	
MB 240-512503/7	Method Blank	Total/NA	Water	8260B	
LCS 240-512503/4	Lab Control Sample	Total/NA	Water	8260B	
240-159310-H-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159310-K-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159298-1

Client Sample ID: TRIP BLANK_23

Lab Sample ID: 240-159298-1

Date Collected: 11/01/21 00:00

Matrix: Water

Date Received: 11/04/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512503	11/11/21 14:35	LEE	TAL CAN

Client Sample ID: MW-177S_110221

Lab Sample ID: 240-159298-2

Date Collected: 11/01/21 11:45

Matrix: Water

Date Received: 11/04/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512503	11/11/21 14:57	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512125	11/09/21 22:48	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159298-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Andrew Burnett	TAT if different from below: ☐ 3 weeks ☑ 10 day ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client:
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_23	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1775_110121	11/1/21	1145		X						G					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159298 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Andrew Burnett	Arcadis	11/1/21 1640	Novi Cold Storage	Arcadis	11/1/21 1640
Christine Ellen	ARCADIS	11/3/21 0940	Teri Hare	ETA	11/3/21 946
Teri Hare	ETA	11/3/21 1006	Received in Laboratory by: Marilyn Black	Company: ETA	Date/Time: 11-4-21 8:00

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11/17/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159298**
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Mandy Bloce

Cooler Received on 11-4-21 Opened on 11-4-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # 7A Foam Box Client Cooler Box Other _____

Packing material used: ~~Bubble Wrap~~ Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF **+0.1** °C) Observed Cooler Temp. 0.9 °C Corrected Cooler Temp. 1.0 °C
   IR GUN #IR-15 (CF **+0.2**°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity _____	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# **HC157842**
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

The TB is not logged for SIM due to insufficient Volume. 11-4-21

11-4-21

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

November 17, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159298-1
Sample date: 2021-11-01
Report received by CADENA: 2021-11-17
Initial Data Verification completed by CADENA: 2021-11-17
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159298-1

		Sample Name:	TRIP BLANK_23				MW-177S_110221			
		Lab Sample ID:	2401592981				2401592982			
		Sample Date:	11/1/2021				11/1/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

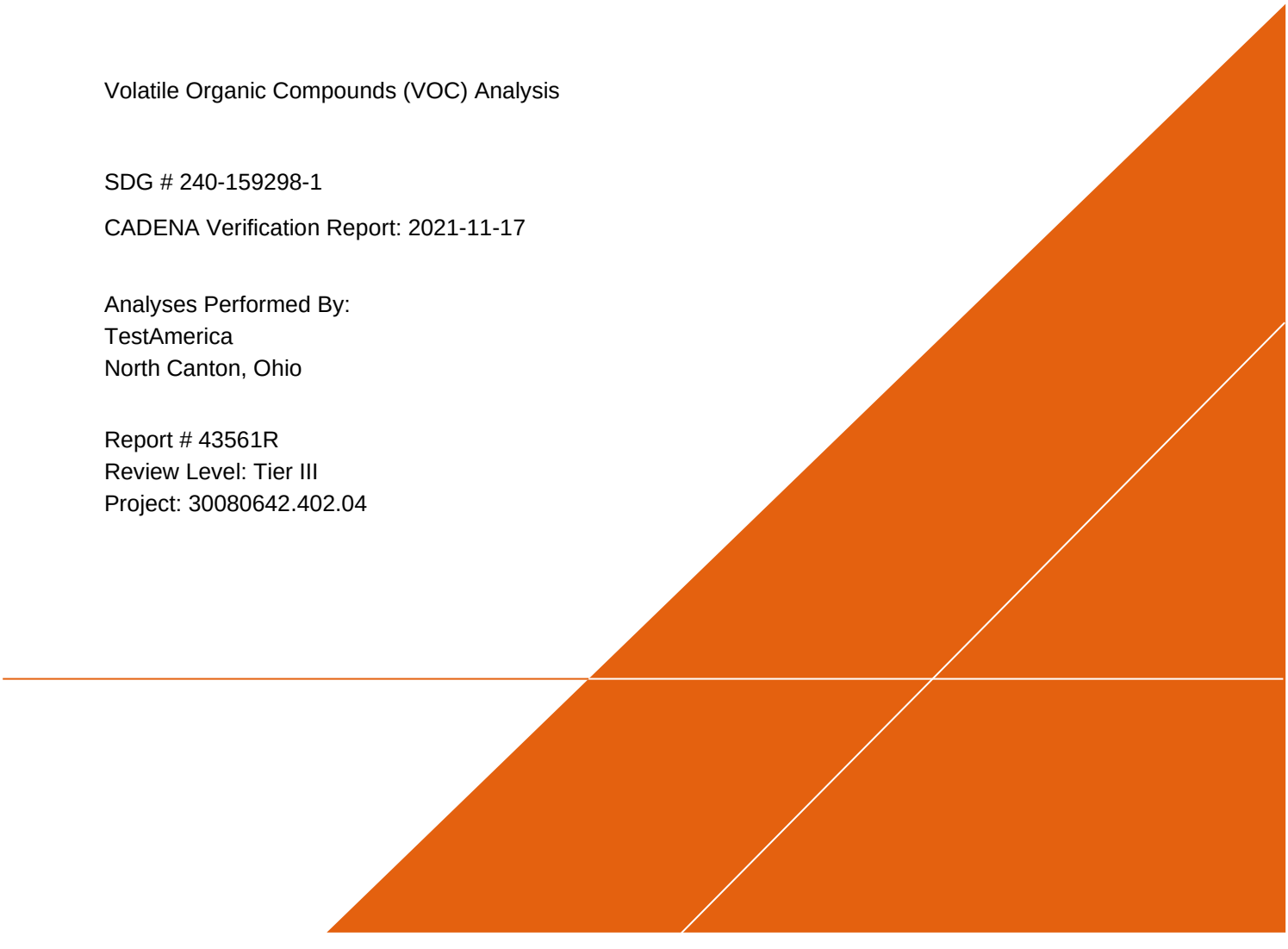
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159298-1

CADENA Verification Report: 2021-11-17

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43561R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159298-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_23	240-159298-1	Water	11/01/2021		X	
MW-177S_110221	240-159298-2	Water	11/01/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Compound	Criteria
TRIP BLANK_23 MW-177S_110221	Continuous Calibration Verification %D	trans-1,2-Dichloroethene	+21.5%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	

Initial/Continuing	Criteria	Sample Result	Qualification
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE: 

DATE: December 07, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 7, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

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Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Andrew Burnett	TAT if different from below: ☐ 3 weeks ☑ 10 day ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling:
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_23	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1775_110121	11/1/21	1145		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159298 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: Andrew Burnett	Arcadis	11/1/21 1640	Received by: Novi Cold Storage	Arcadis	11/1/21 1640
Relinquished by: Christopher Allen	Arcadis	11/3/21 0940	Received by: Teri Hare	ETA	11/3/21 946
Relinquished by: Teri Hare	ETA	11/3/21 1006	Received in Laboratory by: Marilyn Black	ETA	11-4-21 8:00

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11/17/2021

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159298-1

Client Sample ID: TRIP BLANK_23

Date Collected: 11/01/21 00:00
Date Received: 11/04/21 08:00

Lab Sample ID: 240-159298-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 14:35	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 14:35	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 14:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 14:35	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 14:35	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 14:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*121*		*62 - 137*		*11/11/21 14:35*	*1*
4-Bromofluorobenzene (Surr)	*73*		*56 - 136*		*11/11/21 14:35*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/11/21 14:35*	*1*
Dibromofluoromethane (Surr)	*107*		*73 - 120*		*11/11/21 14:35*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159298-1

Client Sample ID: MW-177S_110221
Date Collected: 11/01/21 11:45
Date Received: 11/04/21 08:00

Lab Sample ID: 240-159298-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/09/21 22:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*66 - 120*		*11/09/21 22:48*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 14:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 14:57	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 14:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 14:57	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 14:57	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 14:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*118*		*62 - 137*		*11/11/21 14:57*	*1*
4-Bromofluorobenzene (Surr)	*71*		*56 - 136*		*11/11/21 14:57*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/11/21 14:57*	*1*
Dibromofluoromethane (Surr)	*103*		*73 - 120*		*11/11/21 14:57*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159510-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/22/2021 7:51:11 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159510-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159510-1

Job ID: 240-159510-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159510-1

Comments
No additional comments.

Receipt
The samples were received on 11/6/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.1º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159510-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159510-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159510-1	TRIP BLANK_08	Water	11/03/21 00:00	11/06/21 08:00
240-159510-2	MW-184S_110321	Water	11/03/21 10:00	11/06/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159510-1

Client Sample ID: TRIP BLANK_08 — Lab Sample ID: 240-159510-1

No Detections.

Client Sample ID: MW-184S_110321 — Lab Sample ID: 240-159510-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159510-1

Client Sample ID: TRIP BLANK_08
Date Collected: 11/03/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159510-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 20:59	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 20:59	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 20:59	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 20:59	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 20:59	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 20:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*		*11/13/21 20:59*	*1*
4-Bromofluorobenzene (Surr)	*79*		*56 - 136*		*11/13/21 20:59*	*1*
Toluene-d8 (Surr)	*109*		*78 - 122*		*11/13/21 20:59*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/13/21 20:59*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159510-1

Client Sample ID: MW-184S_110321
Date Collected: 11/03/21 10:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159510-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 00:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*11/12/21 00:38*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 21:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 21:22	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 21:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 21:22	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 21:22	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 21:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*		*11/13/21 21:22*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/13/21 21:22*	*1*
Toluene-d8 (Surr)	*111*		*78 - 122*		*11/13/21 21:22*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/13/21 21:22*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159510-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159418-E-2 MS	Matrix Spike	93	87	106	94
240-159418-L-2 MSD	Matrix Spike Duplicate	90	87	107	91
240-159510-1	TRIP BLANK_08	98	79	109	96
240-159510-2	MW-184S_110321	103	81	111	102
LCS 240-512817/4	Lab Control Sample	90	89	112	90
MB 240-512817/6	Method Blank	98	81	112	98

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159418-H-2 MS	Matrix Spike	82
240-159418-P-2 MSD	Matrix Spike Duplicate	83
240-159510-2	MW-184S_110321	82
LCS 240-512585/4	Lab Control Sample	81
MB 240-512585/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512817/6
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 13:55	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 13:55	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:55	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 13:55	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:55	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 13:55	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*		*11/13/21 13:55*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/13/21 13:55*	*1*
Toluene-d8 (Surr)	*112*		*78 - 122*		*11/13/21 13:55*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/13/21 13:55*	*1*

Lab Sample ID: LCS 240-512817/4
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.9		ug/L		109	63 - 134
cis-1,2-Dichloroethene	10.0	10.3		ug/L		103	77 - 123
Tetrachloroethene	10.0	11.9		ug/L		119	76 - 123
trans-1,2-Dichloroethene	10.0	10.8		ug/L		108	75 - 124
Trichloroethene	10.0	9.19		ug/L		92	70 - 122
Vinyl chloride	10.0	9.48		ug/L		95	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*89*		*56 - 136*
Toluene-d8 (Surr)	*112*		*78 - 122*
Dibromofluoromethane (Surr)	*90*		*73 - 120*

Lab Sample ID: 240-159418-E-2 MS
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	10.3		ug/L		103	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.89		ug/L		99	66 - 128
Tetrachloroethene	1.0	U	10.0	9.53		ug/L		95	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.91		ug/L		99	56 - 136
Trichloroethene	1.0	U	10.0	8.16		ug/L		82	61 - 124
Vinyl chloride	1.0	U	10.0	9.96		ug/L		100	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*106*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159418-E-2 MS
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: 240-159418-L-2 MSD
Matrix: Water
Analysis Batch: 512817

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	10.0		ug/L		100	56 - 135	2	26
cis-1,2-Dichloroethene	1.0	U	10.0	10.1		ug/L		101	66 - 128	2	14
Tetrachloroethene	1.0	U	10.0	10.1		ug/L		101	62 - 131	5	20
trans-1,2-Dichloroethene	1.0	U	10.0	10.1		ug/L		101	56 - 136	2	15
Trichloroethene	1.0	U	10.0	8.61		ug/L		86	61 - 124	5	15
Vinyl chloride	1.0	U	10.0	10.2		ug/L		102	43 - 157	3	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*
Toluene-d8 (Surr)	*107*		*78 - 122*
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512585/5
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/11/21 19:04	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/11/21 19:04*	*1*

Lab Sample ID: LCS 240-512585/4
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.86		ug/L		99	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*

Lab Sample ID: 240-159418-H-2 MS
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	11.1		ug/L		111	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159418-P-2 MSD
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.2		ug/L		102	51 - 153	8	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159510-1

GC/MS VOA

Analysis Batch: 512585

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159510-2	MW-184S_110321	Total/NA	Water	8260B SIM	
MB 240-512585/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512585/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159418-H-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159418-P-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 512817

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159510-1	TRIP BLANK_08	Total/NA	Water	8260B	
240-159510-2	MW-184S_110321	Total/NA	Water	8260B	
MB 240-512817/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512817/4	Lab Control Sample	Total/NA	Water	8260B	
240-159418-E-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159418-L-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159510-1

Client Sample ID: TRIP BLANK_08

Lab Sample ID: 240-159510-1

Date Collected: 11/03/21 00:00

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512817	11/13/21 20:59	LEE	TAL CAN

Client Sample ID: MW-184S_110321

Lab Sample ID: 240-159510-2

Date Collected: 11/03/21 10:00

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512817	11/13/21 21:22	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512585	11/12/21 00:38	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159510-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

TestAmerica

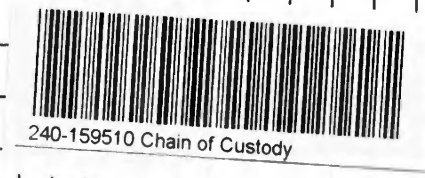
TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Seth Turner	TAT if different from below		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:	10 day — 3 weeks / ✓ 2 weeks / 1 week / 2 days / 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK 06	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1845_110321	11/3/21	1000		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM



Possible Hazard Identification
✓ Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Return to Client ✓ Disposal By Lab Archive For Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Seth Turner	Arcadis	11/4/21 / 1500	Novi Cold Storage	Arcadis	11/4/21 / 1500
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	ARCADIS	11/5/21 / 1435		ETA	11/5/21 1435
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
Jen Heal	ETA	11/5/21 1446	M. A.	ETA	11/6/21 8:00

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 159510

Client ARCADIS Site Name _____

Cooler unpacked by: Matthew Surma

Cooler Received on 11/6/21 Opened on 11/6/21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 1.0 °C Corrected Cooler Temp. 1.1 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# HC157842
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 0104201G (Yes) No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

November 22, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159510-1
Sample date: 2021-11-03
Report received by CADENA: 2021-11-22
Initial Data Verification completed by CADENA: 2021-11-22
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159510-1

		Sample Name:	TRIP BLANK_08				MW-184S_110321			
		Lab Sample ID:	2401595101				2401595102			
		Sample Date:	11/3/2021				11/3/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

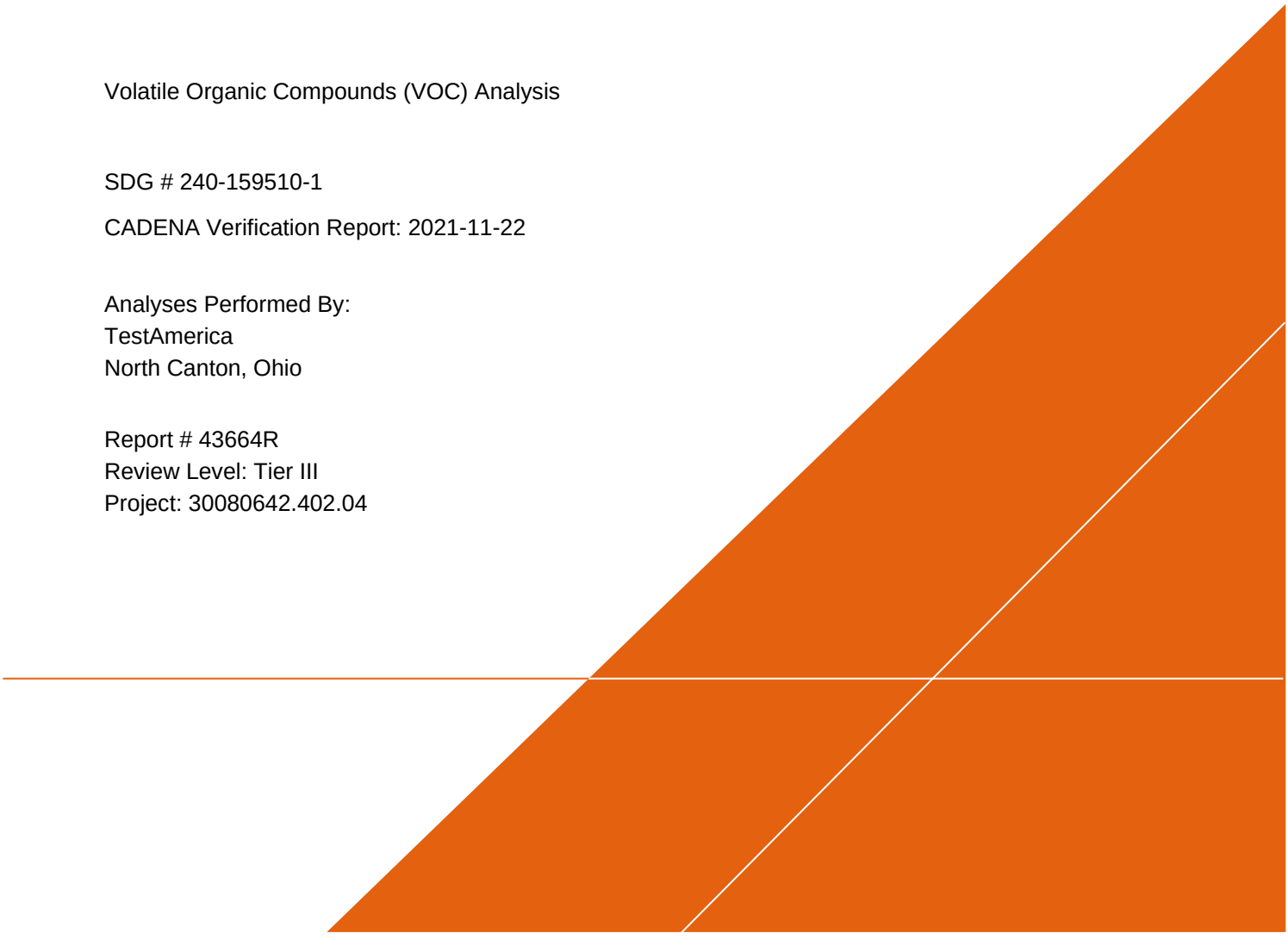
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159510-1

CADENA Verification Report: 2021-11-22

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43664R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159510-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_08	240-159510-1	Water	11/03/21		X	
MW-184S_110321	240-159510-2	Water	11/03/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 09, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 09, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Seth Turner	TAT if different from below: 10 day; 3 weeks, ✓ 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_05	—	—		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-184S_110321	11/3/21	1000		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159510 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; ✓ Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company:	Date/Time:		Company:	Date/Time:
Relinquished by: Seth Turner	Arcadis	11/4/21 / 1500	Received by: Novi Cold Storage	Arcadis	11/4/21 / 1500
Relinquished by: [signature]	ARCADIS	11/5/21 / 1435	Received by: [signature]	ETA	11/5/21 1435
Relinquished by: [signature]	ETA	11/5/21 1446	Received in Laboratory by: M. D.	ETA	11/6/21 8:00

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Client Sample ID: TRIP BLANK_08
Lab Sample ID: 240-159510-1
Date Collected: 11/03/21 00:00
Matrix: Water
Date Received: 11/06/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 20:59	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 20:59	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 20:59	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 20:59	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 20:59	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 20:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*		*11/13/21 20:59*	*1*
4-Bromofluorobenzene (Surr)	*79*		*56 - 136*		*11/13/21 20:59*	*1*
Toluene-d8 (Surr)	*109*		*78 - 122*		*11/13/21 20:59*	*1*
Dibromofluoromethane (Surr)	*96*		*73 - 120*		*11/13/21 20:59*	*1*

Client Sample ID: MW-184S_110321
Lab Sample ID: 240-159510-2
Date Collected: 11/03/21 10:00
Matrix: Water
Date Received: 11/06/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 00:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*11/12/21 00:38*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 21:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 21:22	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 21:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 21:22	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 21:22	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 21:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*		*11/13/21 21:22*	*1*
4-Bromofluorobenzene (Surr)	*81*		*56 - 136*		*11/13/21 21:22*	*1*
Toluene-d8 (Surr)	*111*		*78 - 122*		*11/13/21 21:22*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/13/21 21:22*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159300-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/17/2021 12:39:37 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159300-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159300-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159300-1

Comments
No additional comments.

Receipt
The samples were received on 11/4/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.0° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159300-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159300-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159300-1	TRIP BLANK_22	Water	11/02/21 00:00	11/04/21 08:00
240-159300-2	MW-167S_110221	Water	11/02/21 15:00	11/04/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159300-1

Client Sample ID: TRIP BLANK_22 — Lab Sample ID: 240-159300-1

No Detections.

Client Sample ID: MW-167S_110221 — Lab Sample ID: 240-159300-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159300-1

Client Sample ID: TRIP BLANK_22
Date Collected: 11/02/21 00:00
Date Received: 11/04/21 08:00

Lab Sample ID: 240-159300-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 18:35	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 18:35	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 18:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 18:35	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 18:35	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 18:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*62 - 137*		*11/11/21 18:35*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/11/21 18:35*	*1*
Toluene-d8 (Surr)	*90*		*78 - 122*		*11/11/21 18:35*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/11/21 18:35*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159300-1

Client Sample ID: MW-167S_110221

Date Collected: 11/02/21 15:00
Date Received: 11/04/21 08:00

Lab Sample ID: 240-159300-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/09/21 23:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*66 - 120*		*11/09/21 23:12*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 18:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 18:57	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 18:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 18:57	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 18:57	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 18:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*121*		*62 - 137*		*11/11/21 18:57*	*1*
4-Bromofluorobenzene (Surr)	*72*		*56 - 136*		*11/11/21 18:57*	*1*
Toluene-d8 (Surr)	*90*		*78 - 122*		*11/11/21 18:57*	*1*
Dibromofluoromethane (Surr)	*104*		*73 - 120*		*11/11/21 18:57*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159300-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159300-1	TRIP BLANK_22	117	70	90	102
240-159300-2	MW-167S_110221	121	72	90	104
240-159310-H-2 MS	Matrix Spike	103	98	103	94
240-159310-K-2 MSD	Matrix Spike Duplicate	103	96	102	92
LCS 240-512503/4	Lab Control Sample	102	94	101	93
MB 240-512503/7	Method Blank	114	77	90	98

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159300-2	MW-167S_110221	91
240-159369-D-5 MS	Matrix Spike	92
240-159369-D-5 MSD	Matrix Spike Duplicate	89
LCS 240-512125/4	Lab Control Sample	93
MB 240-512125/5	Method Blank	91

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512503/7
Matrix: Water
Analysis Batch: 512503

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 13:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 13:07	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 13:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 13:07	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 13:07	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 13:07	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*114*		*62 - 137*		*11/11/21 13:07*	*1*
4-Bromofluorobenzene (Surr)	*77*		*56 - 136*		*11/11/21 13:07*	*1*
Toluene-d8 (Surr)	*90*		*78 - 122*		*11/11/21 13:07*	*1*
Dibromofluoromethane (Surr)	*98*		*73 - 120*		*11/11/21 13:07*	*1*

Lab Sample ID: LCS 240-512503/4
Matrix: Water
Analysis Batch: 512503

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.54		ug/L		85	63 - 134
cis-1,2-Dichloroethene	10.0	10.9		ug/L		109	77 - 123
Tetrachloroethene	10.0	9.61		ug/L		96	76 - 123
trans-1,2-Dichloroethene	10.0	11.3		ug/L		113	75 - 124
Trichloroethene	10.0	9.58		ug/L		96	70 - 122
Vinyl chloride	10.0	8.69		ug/L		87	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*
Toluene-d8 (Surr)	*101*		*78 - 122*
Dibromofluoromethane (Surr)	*93*		*73 - 120*

Lab Sample ID: 240-159310-H-2 MS
Matrix: Water
Analysis Batch: 512503

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	8.69		ug/L		87	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.70		ug/L		97	66 - 128
Tetrachloroethene	1.0	U	10.0	8.74		ug/L		87	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	10.1		ug/L		101	56 - 136
Trichloroethene	1.0	U	10.0	8.43		ug/L		84	61 - 124
Vinyl chloride	1.0	U	10.0	8.11		ug/L		81	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*
4-Bromofluorobenzene (Surr)	*98*		*56 - 136*
Toluene-d8 (Surr)	*103*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159310-H-2 MS
Matrix: Water
Analysis Batch: 512503

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: 240-159310-K-2 MSD
Matrix: Water
Analysis Batch: 512503

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	8.78		ug/L		88	56 - 135	1	26
cis-1,2-Dichloroethene	1.0	U	10.0	10.0		ug/L		100	66 - 128	3	14
Tetrachloroethene	1.0	U	10.0	8.65		ug/L		86	62 - 131	1	20
trans-1,2-Dichloroethene	1.0	U	10.0	10.2		ug/L		102	56 - 136	1	15
Trichloroethene	1.0	U	10.0	8.58		ug/L		86	61 - 124	2	15
Vinyl chloride	1.0	U	10.0	8.51		ug/L		85	43 - 157	5	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*103*		*62 - 137*
4-Bromofluorobenzene (Surr)	*96*		*56 - 136*
Toluene-d8 (Surr)	*102*		*78 - 122*
Dibromofluoromethane (Surr)	*92*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512125/5
Matrix: Water
Analysis Batch: 512125

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/09/21 13:38	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*66 - 120*		*11/09/21 13:38*	*1*

Lab Sample ID: LCS 240-512125/4
Matrix: Water
Analysis Batch: 512125

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.3		ug/L		103	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*66 - 120*

Lab Sample ID: 240-159369-D-5 MS
Matrix: Water
Analysis Batch: 512125

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	9.49		ug/L		95	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*92*		*66 - 120*

Lab Sample ID: 240-159369-D-5 MSD
Matrix: Water
Analysis Batch: 512125

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.5		ug/L		105	51 - 153	11	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*89*		*66 - 120*

GC/MS VOA

Analysis Batch: 512125

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159300-2	MW-167S_110221	Total/NA	Water	8260B SIM	
MB 240-512125/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512125/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159369-D-5 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159369-D-5 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 512503

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159300-1	TRIP BLANK_22	Total/NA	Water	8260B	
240-159300-2	MW-167S_110221	Total/NA	Water	8260B	
MB 240-512503/7	Method Blank	Total/NA	Water	8260B	
LCS 240-512503/4	Lab Control Sample	Total/NA	Water	8260B	
240-159310-H-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159310-K-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159300-1

Client Sample ID: TRIP BLANK_22

Lab Sample ID: 240-159300-1

Date Collected: 11/02/21 00:00

Matrix: Water

Date Received: 11/04/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512503	11/11/21 18:35	LEE	TAL CAN

Client Sample ID: MW-167S_110221

Lab Sample ID: 240-159300-2

Date Collected: 11/02/21 15:00

Matrix: Water

Date Received: 11/04/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512503	11/11/21 18:57	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512125	11/09/21 23:12	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159300-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

MICHIGAN 190

TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton -- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Allyson Hartz	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day (10 day)		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_22	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1675_110221	11/2/21	1500		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159300 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomaila@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Allyson Hartz	Arcadis	11/2/21 1615	Navicom Storage	Arcadis	11/2/21 1615
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	ARCADIS	11/3/21 0940	Jeri Hart	EPA	11/3/21 946
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
Jeri Hart	EPA	11/3/21 1000	Marilyn Block	EPA	11-4-21 8:00

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11/17/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 59300**
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Mandy Black

Cooler Received on 11-4-21 Opened on 11-4-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.9 °C Corrected Cooler Temp. 1.0 °C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity _____	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

JMP 11/4/21

pH Strip Lot# **HC157842**

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

The TB is not logged for SIM. due to insufficient volume.

JMP 11-4-21

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

November 17, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 WA03 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159300-1
Sample date: 2021-11-02
Report received by CADENA: 2021-11-17
Initial Data Verification completed by CADENA: 2021-11-17
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159300-1

		Sample Name:	TRIP BLANK_22				MW-167S_110221			
		Lab Sample ID:	2401593001				2401593002			
		Sample Date:	11/2/2021				11/2/2021			
Analyte		Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC										
	OSW-8260B									
	1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	OSW-8260BBSim									
	1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

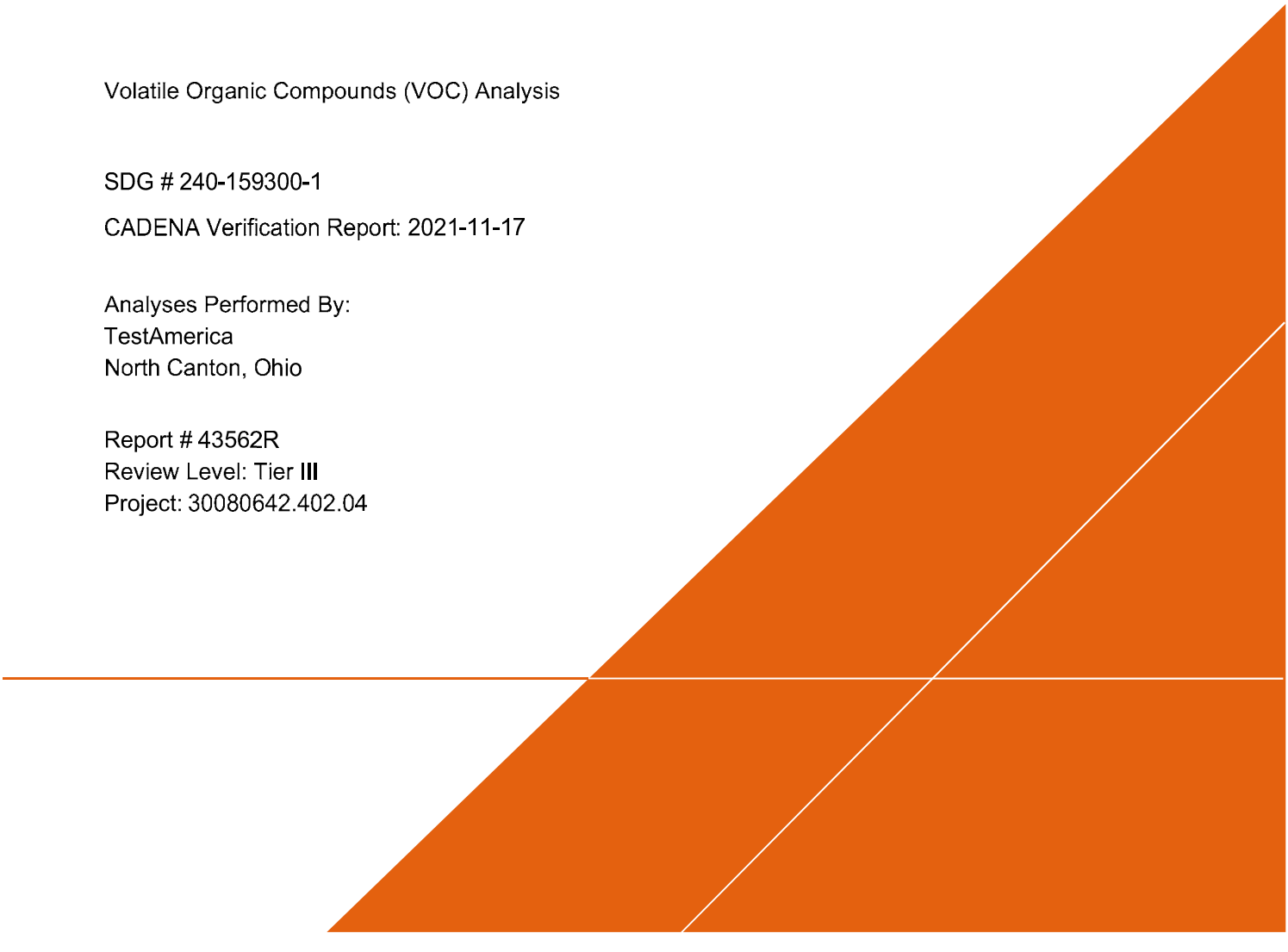
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159300-1

CADENA Verification Report: 2021-11-17

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43562R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159300-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_22	240-159300-1	Water	11/02/2021		X	
MW-167S_110221	240-159300-2	Water	11/02/2021		X	X

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Compound	Criteria
TRIP BLANK_22 MW-167S_110221	Continuous Calibration Verification %D	trans-1,2-Dichloroethene	+21.5%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	

Initial/Continuing	Criteria	Sample Result	Qualification
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE: 

DATE: December 07, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 7, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190

Chain of Custody Record

MICHIGAN 190

TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton -- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Allyson Hartz	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day (10 day)		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_22	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1675_110221	11/2/21	1500		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159300 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomaila@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Allyson Hartz	Arcadis	11/2/21 1615	Navicom Storage	Arcadis	11/2/21 1615
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	ARCADIS	11/3/21 0940	Jeri Hart	EPA	11/3/21 946
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
Jeri Hart	EPA	11/3/21 1000	Marilyn Block	EPA	11-4-21 8:00

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11/17/2021

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159300-1

Client Sample ID: TRIP BLANK_22
Date Collected: 11/02/21 00:00
Date Received: 11/04/21 08:00

Lab Sample ID: 240-159300-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 18:35	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 18:35	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 18:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 18:35	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 18:35	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 18:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*62 - 137*		*11/11/21 18:35*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/11/21 18:35*	*1*
Toluene-d8 (Surr)	*90*		*78 - 122*		*11/11/21 18:35*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/11/21 18:35*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159300-1

Client Sample ID: MW-167S_110221

Date Collected: 11/02/21 15:00
Date Received: 11/04/21 08:00

Lab Sample ID: 240-159300-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/09/21 23:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*66 - 120*		*11/09/21 23:12*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/11/21 18:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/11/21 18:57	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 18:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/11/21 18:57	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/11/21 18:57	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/11/21 18:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*121*		*62 - 137*		*11/11/21 18:57*	*1*
4-Bromofluorobenzene (Surr)	*72*		*56 - 136*		*11/11/21 18:57*	*1*
Toluene-d8 (Surr)	*90*		*78 - 122*		*11/11/21 18:57*	*1*
Dibromofluoromethane (Surr)	*104*		*73 - 120*		*11/11/21 18:57*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159521-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/22/2021 8:07:32 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159521-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159521-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159521-1

Comments
No additional comments.

Receipt
The samples were received on 11/6/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.3º C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) for analytical batch 512819 exceeded control criteria for Vinyl Chloride. The samples associated with this CCV were non-detect for the affected analytes. In accordance with the laboratory SOP, a low level CCV at the reporting limit (labeled as an MRL) was analyzed and the affected compounds were detected; therefore the data has been reported. No further corrective action was required: TRIP BLANK_49 (240-159521-1) and MW-162S_110421 (240-159521-2).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159521-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159521-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159521-1	TRIP BLANK_49	Water	11/04/21 00:00	11/06/21 08:00
240-159521-2	MW-162S_110421	Water	11/04/21 13:41	11/06/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159521-1

Client Sample ID: TRIP BLANK_49 — Lab Sample ID: 240-159521-1

No Detections.

Client Sample ID: MW-162S_110421 — Lab Sample ID: 240-159521-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159521-1

Client Sample ID: TRIP BLANK_49
Date Collected: 11/04/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159521-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 19:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 19:24	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 19:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 19:24	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 19:24	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 19:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*128*		*62 - 137*		*11/13/21 19:24*	*1*
4-Bromofluorobenzene (Surr)	*67*		*56 - 136*		*11/13/21 19:24*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/13/21 19:24*	*1*
Dibromofluoromethane (Surr)	*110*		*73 - 120*		*11/13/21 19:24*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159521-1

Client Sample ID: MW-162S_110421
Date Collected: 11/04/21 13:41
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159521-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 03:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*		*11/12/21 03:25*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 19:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 19:46	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 19:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 19:46	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 19:46	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 19:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*128*		*62 - 137*		*11/13/21 19:46*	*1*
4-Bromofluorobenzene (Surr)	*66*		*56 - 136*		*11/13/21 19:46*	*1*
Toluene-d8 (Surr)	*87*		*78 - 122*		*11/13/21 19:46*	*1*
Dibromofluoromethane (Surr)	*113*		*73 - 120*		*11/13/21 19:46*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159521-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159521-1	TRIP BLANK_49	128	67	89	110
240-159521-2	MW-162S_110421	128	66	87	113
240-159546-H-2 MSD	Matrix Spike Duplicate	102	98	101	91
240-159546-K-2 MS	Matrix Spike	105	96	102	93
LCS 240-512819/4	Lab Control Sample	100	99	100	91
MB 240-512819/7	Method Blank	119	75	89	102

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159418-H-2 MS	Matrix Spike	82
240-159418-P-2 MSD	Matrix Spike Duplicate	83
240-159521-2	MW-162S_110421	81
LCS 240-512585/4	Lab Control Sample	81
MB 240-512585/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512819/7
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 13:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 13:57	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 13:57	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:57	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 13:57	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*62 - 137*		*11/13/21 13:57*	*1*
4-Bromofluorobenzene (Surr)	*75*		*56 - 136*		*11/13/21 13:57*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/13/21 13:57*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/13/21 13:57*	*1*

Lab Sample ID: LCS 240-512819/4
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.01		ug/L		90	63 - 134
cis-1,2-Dichloroethene	10.0	10.7		ug/L		107	77 - 123
Tetrachloroethene	10.0	9.49		ug/L		95	76 - 123
trans-1,2-Dichloroethene	10.0	11.0		ug/L		110	75 - 124
Trichloroethene	10.0	9.48		ug/L		95	70 - 122
Vinyl chloride	10.0	8.38		ug/L		84	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*99*		*56 - 136*
Toluene-d8 (Surr)	*100*		*78 - 122*
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Lab Sample ID: 240-159546-H-2 MSD
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	8.50		ug/L		85	56 - 135	11	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.62		ug/L		96	66 - 128	1	14
Tetrachloroethene	1.0	U	10.0	8.67		ug/L		87	62 - 131	16	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.76		ug/L		98	56 - 136	3	15
Trichloroethene	1.0	U	10.0	8.44		ug/L		84	61 - 124	9	15
Vinyl chloride	1.0	U	10.0	7.09		ug/L		71	43 - 157	3	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*
4-Bromofluorobenzene (Surr)	*98*		*56 - 136*
Toluene-d8 (Surr)	*101*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159546-H-2 MSD
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Lab Sample ID: 240-159546-K-2 MS
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	7.61		ug/L		76	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.48		ug/L		95	66 - 128
Tetrachloroethene	1.0	U	10.0	7.41		ug/L		74	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.49		ug/L		95	56 - 136
Trichloroethene	1.0	U	10.0	7.75		ug/L		77	61 - 124
Vinyl chloride	1.0	U	10.0	7.30		ug/L		73	43 - 157

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*
4-Bromofluorobenzene (Surr)	*96*		*56 - 136*
Toluene-d8 (Surr)	*102*		*78 - 122*
Dibromofluoromethane (Surr)	*93*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512585/5
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/11/21 19:04	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/11/21 19:04*	*1*

Lab Sample ID: LCS 240-512585/4
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.86		ug/L		99	80 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*

Lab Sample ID: 240-159418-H-2 MS
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	11.1		ug/L		111	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159418-P-2 MSD
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.2		ug/L		102	51 - 153	8	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159521-1

GC/MS VOA

Analysis Batch: 512585

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159521-2	MW-162S_110421	Total/NA	Water	8260B SIM	
MB 240-512585/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512585/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159418-H-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159418-P-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 512819

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159521-1	TRIP BLANK_49	Total/NA	Water	8260B	
240-159521-2	MW-162S_110421	Total/NA	Water	8260B	
MB 240-512819/7	Method Blank	Total/NA	Water	8260B	
LCS 240-512819/4	Lab Control Sample	Total/NA	Water	8260B	
240-159546-H-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	
240-159546-K-2 MS	Matrix Spike	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159521-1

Client Sample ID: TRIP BLANK_49

Lab Sample ID: 240-159521-1

Date Collected: 11/04/21 00:00

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512819	11/13/21 19:24	LEE	TAL CAN

Client Sample ID: MW-162S_110421

Lab Sample ID: 240-159521-2

Date Collected: 11/04/21 13:41

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512819	11/13/21 19:46	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512585	11/12/21 03:25	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159521-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Sommer Guy	TAT if different from below: ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:	10 day		Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn/Ac/NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 49	---	---		X						1					N	G	X	X	X	X	X	X	(2)	1 Trip Blank
MW-1625_110421	11/4/21	13:41		X						6					N	G	X	X	X	X	X	X		3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159521 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Sommer Guy	Arcadis	11/4/21 16:30	Novi Cold Storage	Arcadis	11/4/21 16:30
[signature]	ARCADIS	11/5/21 / 1435	[signature]	ETA	11/5/21 1435
[signature]	ETA	11-5-21 1448	Received in Laboratory by: [signature]	ETA	Date/Time: 11/6/21 8:00

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11/22/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 159521

Client ARCADIS Site Name

Cooler unpacked by: Matthew Surma

Cooler Received on 11/6/21 Opened on 11/6/21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.2 °C Corrected Cooler Temp. 0.3 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes) No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes) No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes (No)
-Were tamper/custody seals intact and uncompromised?	(Yes) No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes (No)
4. Did custody papers accompany the sample(s)?	(Yes) No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes) No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?	
10. Were correct bottle(s) used for the test(s) indicated?	(Yes) No
11. Sufficient quantity received to perform indicated analyses?	(Yes) No
12. Are these work share samples and all listed on the COC?	Yes (No)
If yes, Questions 13-17 have been checked at the originating laboratory.	
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No (NA) pH Strip Lot# HC157842
14. Were VOAs on the COC?	(Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 310420 1G	(Yes) No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

No STM on TB per Corrected COC. (JMR) 11/11/21

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.

Sample(s) ____ were received in a broken container.

Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.

Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

November 22, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159521-1
Sample date: 2021-11-04
Report received by CADENA: 2021-11-22
Initial Data Verification completed by CADENA: 2021-11-22
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159521-1

		Sample Name:	TRIP BLANK_49				MW-162S_110421			
		Lab Sample ID:	2401595211				2401595212			
		Sample Date:	11/4/2021				11/4/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

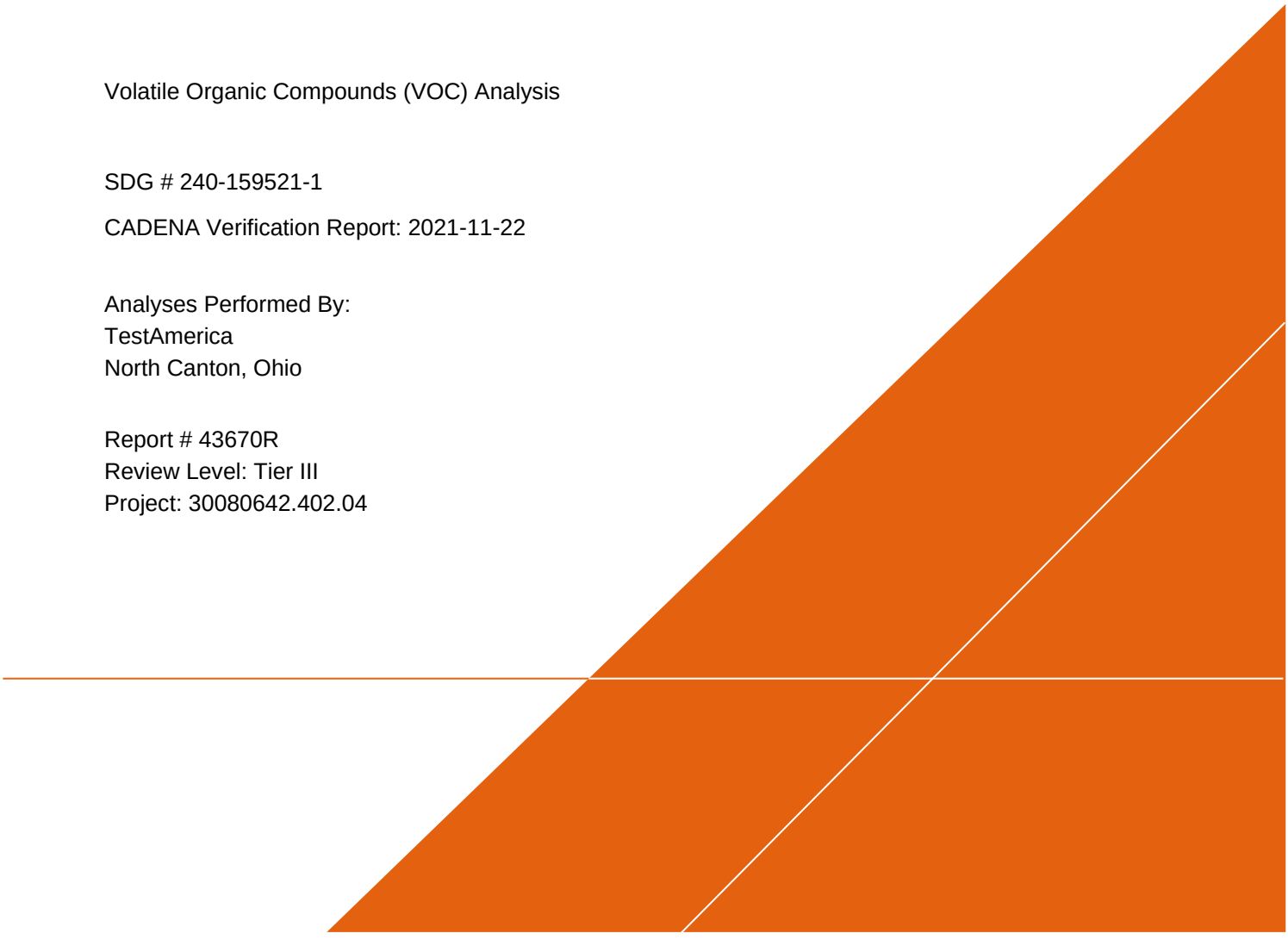
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159521-1

CADENA Verification Report: 2021-11-22

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43670R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159521-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_49	240-159521-1	Water	11/04/21		X	
MW-162S_110421	240-159521-2	Water	11/04/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Compound	Criteria
TRIP BLANK_49 MW-162S_110421	Continuous Calibration Verification %D	Vinyl chloride	-21.2%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	

Initial/Continuing	Criteria	Sample Result	Qualification
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 09, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 09, 2021

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Sommer Guy	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_49	---	---		X						1					N	G	X	X	X	X	X	X	(X)	1 Trip Blank
MW-1625_110421	11/4/21	13:41		X						6					N	G	X	X	X	X	X	X		3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159521 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: Sommer Guy	Arcadis	11/4/21 16:30	Received by: Novi Cold Storage	Arcadis	11/4/21 16:30
Relinquished by: [signature]	Arcadis	11/5/21 / 1435	Received by: [signature]	ETA	11/5/21 1435
Relinquished by: [signature]	ETA	11-5-21 1448	Received in Laboratory by: [signature]	ETA	11/6/21 8:00

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11/22/2021

Client Sample ID: TRIP BLANK_49
Lab Sample ID: 240-159521-1
Date Collected: 11/04/21 00:00
Matrix: Water
Date Received: 11/06/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 19:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 19:24	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 19:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 19:24	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 19:24	1
Vinyl chloride	1.0	~~U~~ UJ	1.0	0.45	ug/L			11/13/21 19:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*128*		*62 - 137*		*11/13/21 19:24*	*1*
4-Bromofluorobenzene (Surr)	*67*		*56 - 136*		*11/13/21 19:24*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/13/21 19:24*	*1*
Dibromofluoromethane (Surr)	*110*		*73 - 120*		*11/13/21 19:24*	*1*

Client Sample ID: MW-162S_110421
Lab Sample ID: 240-159521-2
Date Collected: 11/04/21 13:41
Matrix: Water
Date Received: 11/06/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 03:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*		*11/12/21 03:25*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 19:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 19:46	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 19:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 19:46	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 19:46	1
Vinyl chloride	1.0	~~U~~ UJ	1.0	0.45	ug/L			11/13/21 19:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*128*		*62 - 137*		*11/13/21 19:46*	*1*
4-Bromofluorobenzene (Surr)	*66*		*56 - 136*		*11/13/21 19:46*	*1*
Toluene-d8 (Surr)	*87*		*78 - 122*		*11/13/21 19:46*	*1*
Dibromofluoromethane (Surr)	*113*		*73 - 120*		*11/13/21 19:46*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159615-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/22/2021 3:30:30 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159615-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159615-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159615-1

Comments
No additional comments.

Receipt
The samples were received on 11/9/2021 10:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 3.7° C and 3.8° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159615-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159615-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159615-1	TRIP BLANK_56	Water	11/05/21 00:00	11/09/21 10:00
240-159615-2	MW-144S_110521	Water	11/05/21 10:05	11/09/21 10:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159615-1

Client Sample ID: TRIP BLANK_56 — Lab Sample ID: 240-159615-1

No Detections.

Client Sample ID: MW-144S_110521 — Lab Sample ID: 240-159615-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159615-1

Client Sample ID: TRIP BLANK_56
Date Collected: 11/05/21 00:00
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159615-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 14:54	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 14:54	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 14:54	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 14:54	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 14:54	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 14:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/16/21 14:54*	*1*
4-Bromofluorobenzene (Surr)	*90*		*56 - 136*		*11/16/21 14:54*	*1*
Toluene-d8 (Surr)	*98*		*78 - 122*		*11/16/21 14:54*	*1*
Dibromofluoromethane (Surr)	*109*		*73 - 120*		*11/16/21 14:54*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159615-1

Client Sample ID: MW-144S_110521

Lab Sample ID: 240-159615-2

Date Collected: 11/05/21 10:05

Matrix: Water

Date Received: 11/09/21 10:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/13/21 02:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*11/13/21 02:02*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 18:26	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 18:26	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 18:26	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 18:26	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 18:26	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 18:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*		*11/16/21 18:26*	*1*
4-Bromofluorobenzene (Surr)	*89*		*56 - 136*		*11/16/21 18:26*	*1*
Toluene-d8 (Surr)	*96*		*78 - 122*		*11/16/21 18:26*	*1*
Dibromofluoromethane (Surr)	*114*		*73 - 120*		*11/16/21 18:26*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159615-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159615-1	TRIP BLANK_56	99	90	98	109
240-159615-2	MW-144S_110521	102	89	96	114
240-159636-F-2 MS	Matrix Spike	93	93	102	105
240-159636-G-2 MSD	Matrix Spike Duplicate	93	94	103	105
LCS 240-513208/5	Lab Control Sample	86	91	100	101
MB 240-513208/8	Method Blank	91	87	98	108

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159543-G-3 MS	Matrix Spike	85
240-159543-O-3 MSD	Matrix Spike Duplicate	83
240-159615-2	MW-144S_110521	83
LCS 240-512758/4	Lab Control Sample	83
MB 240-512758/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513208/8
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 14:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 14:06	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 14:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 14:06	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 14:06	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 14:06	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*62 - 137*		*11/16/21 14:06*	*1*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*		*11/16/21 14:06*	*1*
Toluene-d8 (Surr)	*98*		*78 - 122*		*11/16/21 14:06*	*1*
Dibromofluoromethane (Surr)	*108*		*73 - 120*		*11/16/21 14:06*	*1*

Lab Sample ID: LCS 240-513208/5
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	28.3		ug/L		113	63 - 134
cis-1,2-Dichloroethene	25.0	26.1		ug/L		104	77 - 123
Tetrachloroethene	25.0	29.3		ug/L		117	76 - 123
trans-1,2-Dichloroethene	25.0	27.4		ug/L		110	75 - 124
Trichloroethene	25.0	27.4		ug/L		110	70 - 122
Vinyl chloride	25.0	24.0		ug/L		96	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*
4-Bromofluorobenzene (Surr)	*91*		*56 - 136*
Toluene-d8 (Surr)	*100*		*78 - 122*
Dibromofluoromethane (Surr)	*101*		*73 - 120*

Lab Sample ID: 240-159636-F-2 MS
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	25.0	25.8		ug/L		103	56 - 135
cis-1,2-Dichloroethene	1.0	U	25.0	24.8		ug/L		99	66 - 128
Tetrachloroethene	1.0	U	25.0	28.9		ug/L		116	62 - 131
trans-1,2-Dichloroethene	1.0	U	25.0	25.3		ug/L		101	56 - 136
Trichloroethene	1.0	U	25.0	25.4		ug/L		101	61 - 124
Vinyl chloride	1.0	U	25.0	22.2		ug/L		89	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*93*		*56 - 136*
Toluene-d8 (Surr)	*102*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159636-F-2 MS
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*105*		*73 - 120*

Lab Sample ID: 240-159636-G-2 MSD
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	25.0	25.9		ug/L		104	56 - 135	0	26
cis-1,2-Dichloroethene	1.0	U	25.0	25.0		ug/L		100	66 - 128	1	14
Tetrachloroethene	1.0	U	25.0	29.5		ug/L		118	62 - 131	2	20
trans-1,2-Dichloroethene	1.0	U	25.0	25.1		ug/L		100	56 - 136	1	15
Trichloroethene	1.0	U	25.0	25.3		ug/L		101	61 - 124	0	15
Vinyl chloride	1.0	U	25.0	22.3		ug/L		89	43 - 157	1	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*
Toluene-d8 (Surr)	*103*		*78 - 122*
Dibromofluoromethane (Surr)	*105*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512758/5
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 16:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/12/21 16:51*	*1*

Lab Sample ID: LCS 240-512758/4
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.63		ug/L		96	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

Lab Sample ID: 240-159543-G-3 MS
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	9.98		ug/L		100	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

Lab Sample ID: 240-159543-O-3 MSD
Matrix: Water
Analysis Batch: 512758

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.71		ug/L		97	51 - 153	3	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

GC/MS VOA

Analysis Batch: 512758

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159615-2	MW-144S_110521	Total/NA	Water	8260B SIM	
MB 240-512758/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512758/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159543-G-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159543-O-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513208

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159615-1	TRIP BLANK_56	Total/NA	Water	8260B	
240-159615-2	MW-144S_110521	Total/NA	Water	8260B	
MB 240-513208/8	Method Blank	Total/NA	Water	8260B	
LCS 240-513208/5	Lab Control Sample	Total/NA	Water	8260B	
240-159636-F-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159636-G-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159615-1

Client Sample ID: TRIP BLANK_56

Lab Sample ID: 240-159615-1

Date Collected: 11/05/21 00:00

Matrix: Water

Date Received: 11/09/21 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513208	11/16/21 14:54	SAM	TAL CAN

Client Sample ID: MW-144S_110521

Lab Sample ID: 240-159615-2

Date Collected: 11/05/21 10:05

Matrix: Water

Date Received: 11/09/21 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513208	11/16/21 18:26	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	512758	11/13/21 02:02	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159615-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

CHIGAN 190

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Allyson Hartz	TAT if different from below: ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client:
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_56	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1945_110521	11/5/21	1005		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159615 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ an Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com, Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: [signature]	Arcadis	11/5/21 1215	Received by: Navicold storage	Arcadis	11/5/21 1215
Relinquished by: [signature]	ARCADIS	11/8/21 1200	Received by: [signature]	ETA	11/8/21 1200
Relinquished by: [signature]	ETA	11/8/21	Received in Laboratory by: [signature]	ETA	11-9-21 1000

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 159615**
Canton Facility

Client ARCADIS Site Name _____ Cooler unpacked by: Tammy Dorr

Cooler Received on 11-9-21 Opened on 11-9-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # 1A Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 2	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?	Yes	
10. Were correct bottle(s) used for the test(s) indicated?	Yes	
11. Sufficient quantity received to perform indicated analyses?	Yes	
12. Are these work share samples and all listed on the COC?	Yes	No

11/9/21 11/9/21

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

If yes, Questions 13-17 have been checked at the originating laboratory.

13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA	pH Strip Lot# HC157842
14. Were VOAs on the COC?	Yes	No	
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	No NA	
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 60358	Yes	No	
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No	

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

The TB is not logged for SIM ~~due to insufficient volume~~, per corrected COC. one 11/11/21 ~~true 11/9/21~~

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

Login # : 159615

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form				
Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
(TA) Client Box Other	(IR-14) IR-15	3.6	3.7	(Wet Ice) Blue Ice Dry Ice Water None
(TA) Client Box Other	(IR-14) IR-15	3.7	3.8	(Wet Ice) Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice

DATA VERIFICATION REPORT

November 22, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159615-1
Sample date: 2021-11-05
Report received by CADENA: 2021-11-22
Initial Data Verification completed by CADENA: 2021-11-22
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159615-1

		Sample Name:	TRIP BLANK_56				MW-144S_110521			
		Lab Sample ID:	2401596151				2401596152			
		Sample Date:	11/5/2021				11/5/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

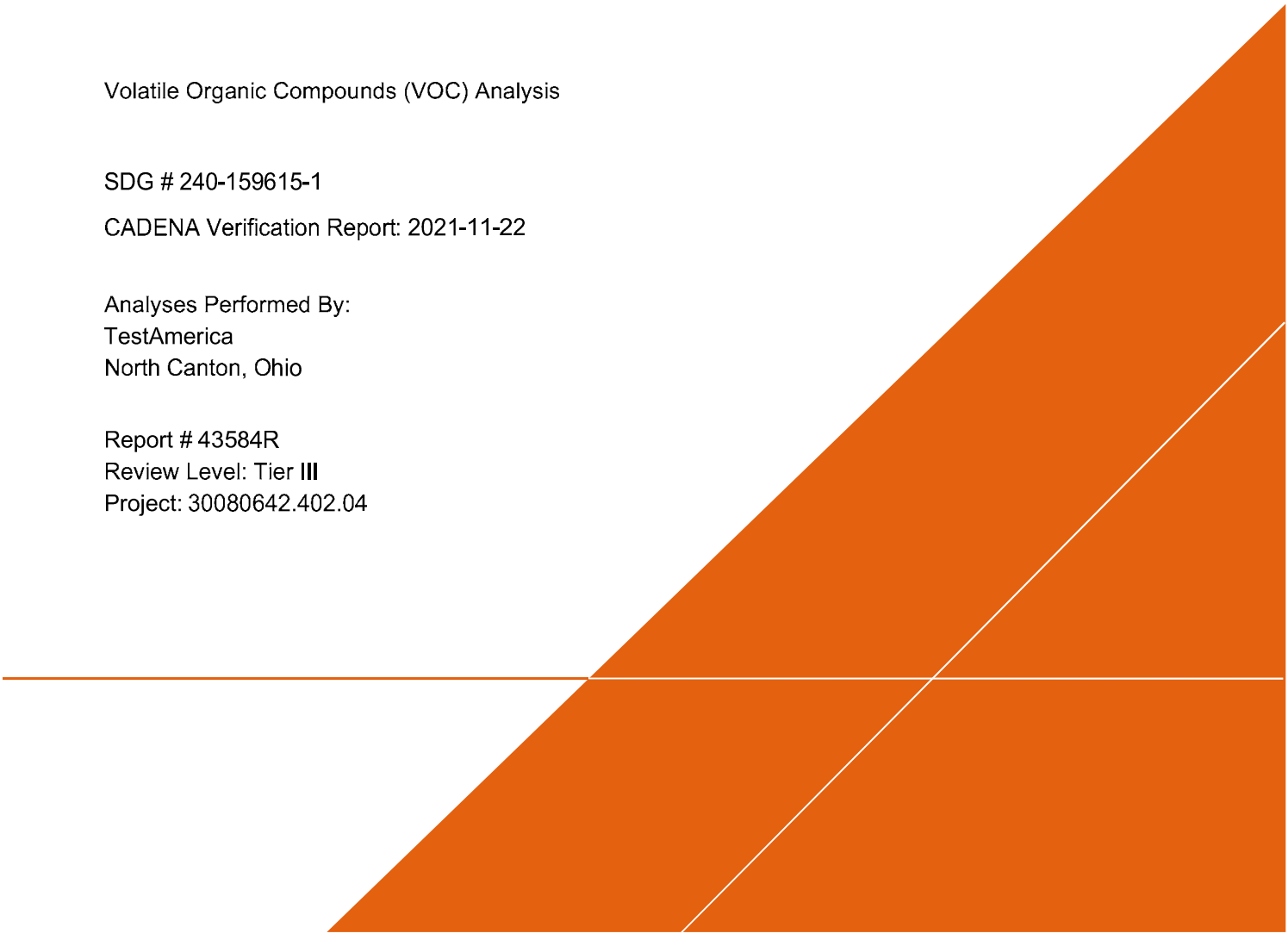
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159615-1

CADENA Verification Report: 2021-11-22

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43584R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159615-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_56	240-159615-1	Water	11/05/21		X	
MW-144S_110521	240-159615-2	Water	11/05/21		X	X

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE: 

DATE: December 14, 2021

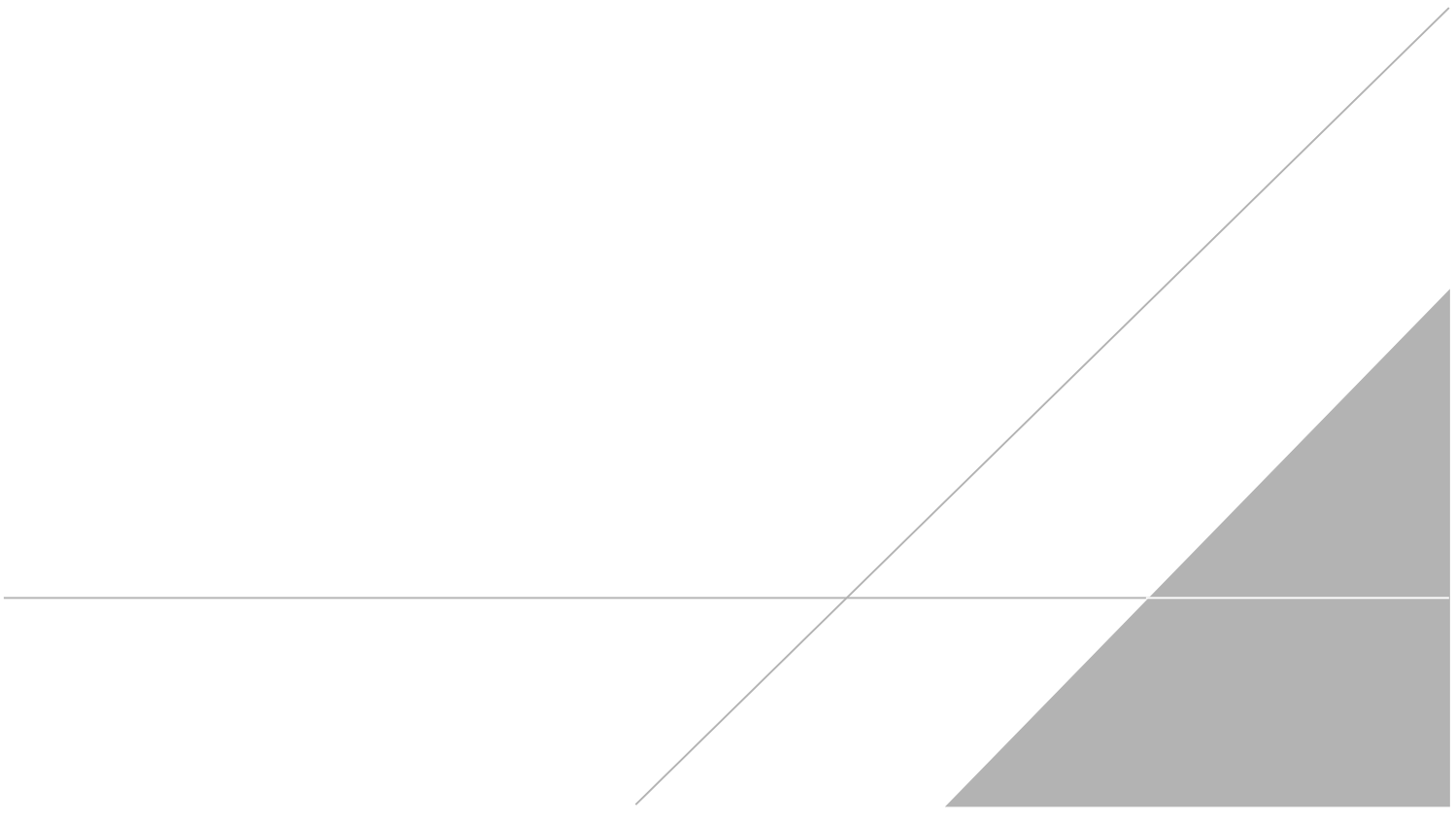
PEER REVIEW: Andrew Korycinski

DATE: December 14, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



Chain of Custody Record

CHIGAN 190

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Allyson Hartz	TAT if different from below: ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client:
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_56	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1945_110521	11/5/21	1005		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159615 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ an Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com, Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: [signature]	Arcadis	11/5/21 1215	Received by: Navicold storage	Arcadis	11/5/21 1215
Relinquished by: [signature]	ARCADIS	11/8/21 1200	Received by: [signature]	ETA	11/8/21 1200
Relinquished by: [signature]	ETA	11/8/21	Received in Laboratory by: [signature]	ETA	11-9-21 1000

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Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159615-1

Client Sample ID: TRIP BLANK_56
Date Collected: 11/05/21 00:00
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159615-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 14:54	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 14:54	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 14:54	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 14:54	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 14:54	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 14:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/16/21 14:54*	*1*
4-Bromofluorobenzene (Surr)	*90*		*56 - 136*		*11/16/21 14:54*	*1*
Toluene-d8 (Surr)	*98*		*78 - 122*		*11/16/21 14:54*	*1*
Dibromofluoromethane (Surr)	*109*		*73 - 120*		*11/16/21 14:54*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159615-1

Client Sample ID: MW-144S_110521

Lab Sample ID: 240-159615-2

Date Collected: 11/05/21 10:05

Matrix: Water

Date Received: 11/09/21 10:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/13/21 02:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*11/13/21 02:02*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 18:26	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 18:26	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 18:26	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 18:26	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 18:26	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 18:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*		*11/16/21 18:26*	*1*
4-Bromofluorobenzene (Surr)	*89*		*56 - 136*		*11/16/21 18:26*	*1*
Toluene-d8 (Surr)	*96*		*78 - 122*		*11/16/21 18:26*	*1*
Dibromofluoromethane (Surr)	*114*		*73 - 120*		*11/16/21 18:26*	*1*

Transmittal Letter

TO
Raymond / Susan Gilreath
Shawn Collins
Jeanne Schlaufman (EGLE)
Todd Walton (Ford)
Chuck Pinter (Ford)
Rob Boley (Schiff Hardin LLP)

FROM
Kris Hinskey
248-994-2240

COPIES TO

DATE
January X, 2022

PROJECT NUMBER
30080642

SUBJECT
Shallow Groundwater Assessment Data Package

We are sending you:

Copies	Date	Drawing No.	Rev.	Description	Action*
1	1/16/2022			Figure	
1	1/16/2022			Analytical Results	
1	1/16/2022			Field Notes	

Action*

☐ A Approved
☐ AN Approved as Noted
☐ AS As Requested
☐ CR Correct and Resubmit
☐ F File
☐ FA For Approval
☐ Resubmit _____ Copies
☐ Return _____ Copies
☐ Review and Comment
☒ Other:

Mailing Method

☐ U.S. Postal Service 1st Class
☐ Courier/Hand Delivery
☐ FedEx Priority Overnight
☐ FedEx 2-Day Delivery
☐ Certified/Registered Mail
☐ United Parcel Service (UPS)
☐ FedEx Standard Overnight
☐ FedEx Economy
☒ Other: Email

Comments:

Thank you for cooperating with the groundwater sampling at your property on November 4, 2021. Attached is your data package.



LEGEND:

APPROXIMATE MONITORING WELL LOCATION

APPROXIMATE PROPERTY BOUNDARIES

0 25 50

SCALE IN FEET

FORD MOTOR COMPANY
LIVONIA TRANSMISSION PLANT
LIVONIA, MICHIGAN

MONITORING WELL LOCATION MW-119S

ARCADIS

FIGURE
1

CITY: NOVI DIV: ENV DB: MG PIC: R. ELLIS PM: K. HINSKEY TM: A. PAULSON TR: M.WACKSMAN PROJECT NUMBER: MI001454.0003.00001 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet
Z:\GISProjects_ENV\Novi\Brighton_MI\Ford\Livonia\GIS\docs\2019-01\MW_LOCATIONS\12034BostonPost\MW-119S.mxd PLOTTED: 1/16/2019 3:02:38 PM BY: msmiller

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159513-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/22/2021 7:55:25 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Certification Summary 16
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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159513-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159513-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159513-1

Comments
No additional comments.

Receipt
The samples were received on 11/6/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.4º C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) for analytical batch 512819 exceeded control criteria for Vinyl Chloride. The samples associated with this CCV were non-detect for the affected analytes. In accordance with the laboratory SOP, a low level CCV at the reporting limit (labeled as an MRL) was analyzed and the affected compounds were detected; therefore the data has been reported. No further corrective action was required: TRIP BLANK_17 (240-159513-1) and MW-119S_110421 (240-159513-2).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159513-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159513-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159513-1	TRIP BLANK_17	Water	11/04/21 00:00	11/06/21 08:00
240-159513-2	MW-119S_110421	Water	11/04/21 11:46	11/06/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159513-1

Client Sample ID: TRIP BLANK_17 — Lab Sample ID: 240-159513-1

No Detections.

Client Sample ID: MW-119S_110421 — Lab Sample ID: 240-159513-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159513-1

Client Sample ID: TRIP BLANK_17
Date Collected: 11/04/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159513-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 15:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 15:46	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 15:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 15:46	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 15:46	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 15:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*123*		*62 - 137*		*11/13/21 15:46*	*1*
4-Bromofluorobenzene (Surr)	*66*		*56 - 136*		*11/13/21 15:46*	*1*
Toluene-d8 (Surr)	*87*		*78 - 122*		*11/13/21 15:46*	*1*
Dibromofluoromethane (Surr)	*107*		*73 - 120*		*11/13/21 15:46*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159513-1

Client Sample ID: MW-119S_110421
Date Collected: 11/04/21 11:46
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159513-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 01:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/12/21 01:26*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 16:08	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 16:08	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 16:08	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 16:08	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 16:08	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 16:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*122*		*62 - 137*		*11/13/21 16:08*	*1*
4-Bromofluorobenzene (Surr)	*68*		*56 - 136*		*11/13/21 16:08*	*1*
Toluene-d8 (Surr)	*86*		*78 - 122*		*11/13/21 16:08*	*1*
Dibromofluoromethane (Surr)	*109*		*73 - 120*		*11/13/21 16:08*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159513-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159513-1	TRIP BLANK_17	123	66	87	107
240-159513-2	MW-119S_110421	122	68	86	109
240-159546-H-2 MSD	Matrix Spike Duplicate	102	98	101	91
240-159546-K-2 MS	Matrix Spike	105	96	102	93
LCS 240-512819/4	Lab Control Sample	100	99	100	91
MB 240-512819/7	Method Blank	119	75	89	102

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159418-H-2 MS	Matrix Spike	82
240-159418-P-2 MSD	Matrix Spike Duplicate	83
240-159513-2	MW-119S_110421	84
LCS 240-512585/4	Lab Control Sample	81
MB 240-512585/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512819/7
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 13:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 13:57	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 13:57	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:57	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 13:57	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*62 - 137*		*11/13/21 13:57*	*1*
4-Bromofluorobenzene (Surr)	*75*		*56 - 136*		*11/13/21 13:57*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/13/21 13:57*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/13/21 13:57*	*1*

Lab Sample ID: LCS 240-512819/4
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.01		ug/L		90	63 - 134
cis-1,2-Dichloroethene	10.0	10.7		ug/L		107	77 - 123
Tetrachloroethene	10.0	9.49		ug/L		95	76 - 123
trans-1,2-Dichloroethene	10.0	11.0		ug/L		110	75 - 124
Trichloroethene	10.0	9.48		ug/L		95	70 - 122
Vinyl chloride	10.0	8.38		ug/L		84	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*99*		*56 - 136*
Toluene-d8 (Surr)	*100*		*78 - 122*
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Lab Sample ID: 240-159546-H-2 MSD
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	8.50		ug/L		85	56 - 135	11	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.62		ug/L		96	66 - 128	1	14
Tetrachloroethene	1.0	U	10.0	8.67		ug/L		87	62 - 131	16	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.76		ug/L		98	56 - 136	3	15
Trichloroethene	1.0	U	10.0	8.44		ug/L		84	61 - 124	9	15
Vinyl chloride	1.0	U	10.0	7.09		ug/L		71	43 - 157	3	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*
4-Bromofluorobenzene (Surr)	*98*		*56 - 136*
Toluene-d8 (Surr)	*101*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159546-H-2 MSD
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Lab Sample ID: 240-159546-K-2 MS
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	7.61		ug/L		76	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.48		ug/L		95	66 - 128
Tetrachloroethene	1.0	U	10.0	7.41		ug/L		74	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.49		ug/L		95	56 - 136
Trichloroethene	1.0	U	10.0	7.75		ug/L		77	61 - 124
Vinyl chloride	1.0	U	10.0	7.30		ug/L		73	43 - 157

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*
4-Bromofluorobenzene (Surr)	*96*		*56 - 136*
Toluene-d8 (Surr)	*102*		*78 - 122*
Dibromofluoromethane (Surr)	*93*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512585/5
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/11/21 19:04	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/11/21 19:04*	*1*

Lab Sample ID: LCS 240-512585/4
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.86		ug/L		99	80 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*

Lab Sample ID: 240-159418-H-2 MS
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	11.1		ug/L		111	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159418-P-2 MSD
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.2		ug/L		102	51 - 153	8	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159513-1

GC/MS VOA

Analysis Batch: 512585

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159513-2	MW-119S_110421	Total/NA	Water	8260B SIM	
MB 240-512585/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512585/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159418-H-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159418-P-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 512819

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159513-1	TRIP BLANK_17	Total/NA	Water	8260B	
240-159513-2	MW-119S_110421	Total/NA	Water	8260B	
MB 240-512819/7	Method Blank	Total/NA	Water	8260B	
LCS 240-512819/4	Lab Control Sample	Total/NA	Water	8260B	
240-159546-H-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	
240-159546-K-2 MS	Matrix Spike	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159513-1

Client Sample ID: TRIP BLANK_17

Lab Sample ID: 240-159513-1

Date Collected: 11/04/21 00:00

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512819	11/13/21 15:46	LEE	TAL CAN

Client Sample ID: MW-119S_110421

Lab Sample ID: 240-159513-2

Date Collected: 11/04/21 11:46

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512819	11/13/21 16:08	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512585	11/12/21 01:26	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159513-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_17	---	---		X						1							X	X	X	X	X	X	X (3)	1 Trip Blank
MW-1195-110421	11/04/21	1146		X						6							X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159513 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	11/04/21 1605	Novi cold storage	Arcadis	11/04/21 1605
Christopher Allen	ARCADIS	11/5/21 1435	Jen Hae	ETA	11/5/21 1435
Jen Hae	ETA	11/5/21 1448	M. [illegible]	ETA	11/6/21 8:00

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11/22/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 159513

Client ARCADIS Site Name

Cooler Received on 11/6/21 Opened on 11/6/21

Cooler unpacked by: Matthew Surma

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.3 °C Corrected Cooler Temp. 0.4 °C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No	(NA) pH Strip Lot# **HC157842**
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 0104201G	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present?	Yes	(No)

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.

Sample(s) were received in a broken container.

Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.

Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

DATA VERIFICATION REPORT

November 22, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159513-1
Sample date: 2021-11-04
Report received by CADENA: 2021-11-22
Initial Data Verification completed by CADENA: 2021-11-22
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159513-1

		Sample Name:	TRIP BLANK_17				MW-119S_110421			
		Lab Sample ID:	2401595131				2401595132			
		Sample Date:	11/4/2021				11/4/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

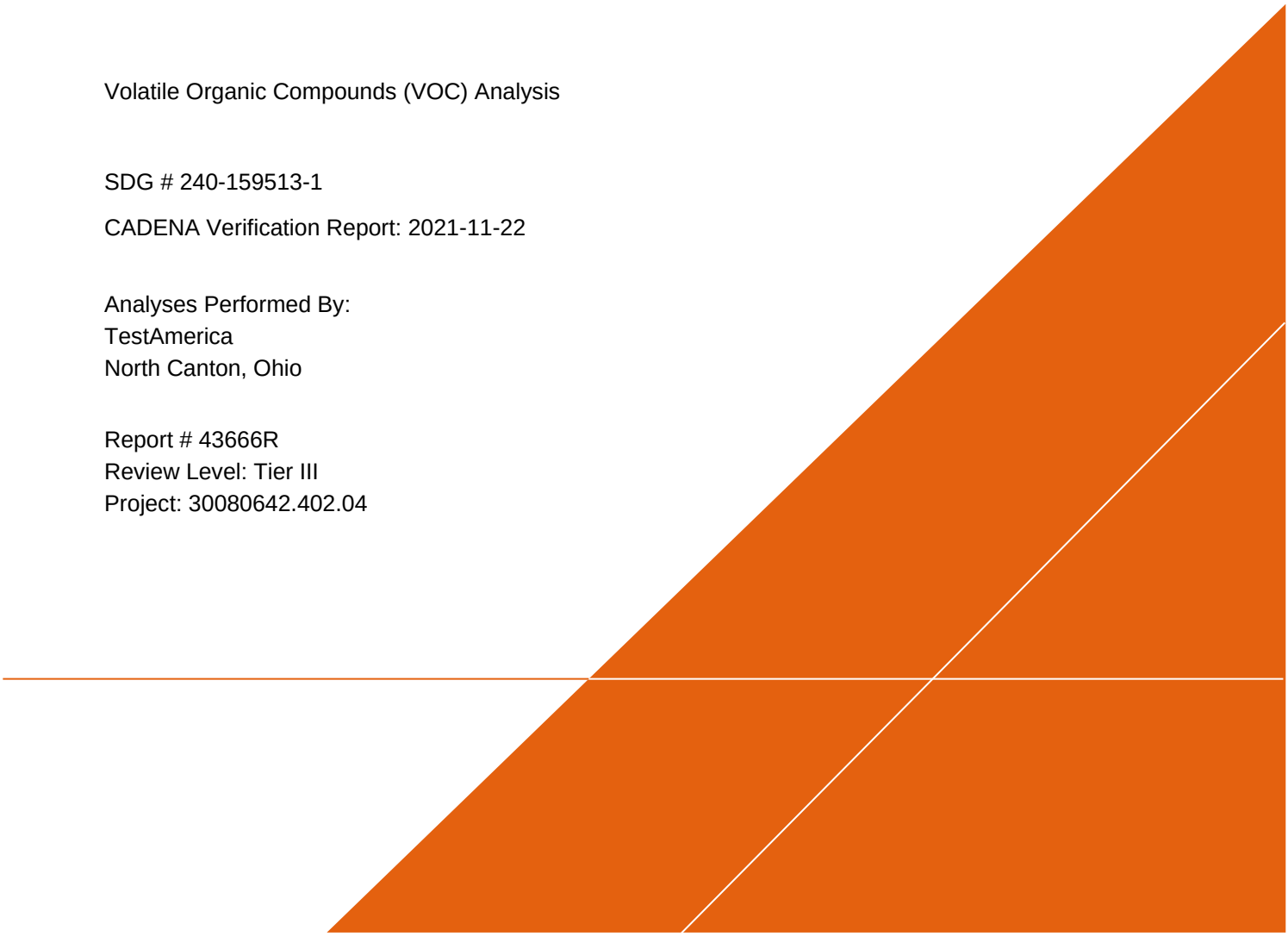
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159513-1

CADENA Verification Report: 2021-11-22

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43666R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159513-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_17	240-159513-1	Water	11/04/21		X	
MW-119S_110421	240-159513-2	Water	11/04/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Compound	Criteria
TRIP BLANK_17 MW-119S_110421	Continuous Calibration Verification %D	Vinyl chloride	-21.2%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	

Initial/Continuing	Criteria	Sample Result	Qualification
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 09, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 09, 2021

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM			Sample Specific Notes / Special Instructions:
TRIP BLANK_17	---	---		X						1							X	X	X	X	X	X	X			1 Trip Blank
MW-1195-110421	11/04/21	1146		X						6							X	X	X	X	X	X	X			3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159513 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	11/04/21 1605	Mili cold storage	Arcadis	11/04/21 1605
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	ARCADIS	11/5/21 1435	[signature]	ETA	11/5/21 1435
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
[signature]	ETA	11/5/21 1448	M. [signature]	ETA	11/6/21 8:00

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11/22/2021

Client Sample ID: TRIP BLANK_17
Lab Sample ID: 240-159513-1
Date Collected: 11/04/21 00:00
Matrix: Water
Date Received: 11/06/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 15:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 15:46	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 15:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 15:46	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 15:46	1
Vinyl chloride	1.0	~~U~~ UJ	1.0	0.45	ug/L			11/13/21 15:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*123*		*62 - 137*		*11/13/21 15:46*	*1*
4-Bromofluorobenzene (Surr)	*66*		*56 - 136*		*11/13/21 15:46*	*1*
Toluene-d8 (Surr)	*87*		*78 - 122*		*11/13/21 15:46*	*1*
Dibromofluoromethane (Surr)	*107*		*73 - 120*		*11/13/21 15:46*	*1*

Client Sample ID: MW-119S_110421
Lab Sample ID: 240-159513-2
Date Collected: 11/04/21 11:46
Matrix: Water
Date Received: 11/06/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 01:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/12/21 01:26*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 16:08	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 16:08	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 16:08	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 16:08	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 16:08	1
Vinyl chloride	1.0	~~U~~ UJ	1.0	0.45	ug/L			11/13/21 16:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*122*		*62 - 137*		*11/13/21 16:08*	*1*
4-Bromofluorobenzene (Surr)	*68*		*56 - 136*		*11/13/21 16:08*	*1*
Toluene-d8 (Surr)	*86*		*78 - 122*		*11/13/21 16:08*	*1*
Dibromofluoromethane (Surr)	*109*		*73 - 120*		*11/13/21 16:08*	*1*

SHALLOW LOW-FLOW GROUNDWATER SAMPLING FORM

Project No.: 30080642.402.01 Page 1 of 1

Site Location: Ford LTP 12034 Boston Post; north side of home

Prepared By: Gary Schafer

Date	Time	Description of Activities
11/4/2021	10:45	Arrive onsite
11/4/2021	10:50	Record static depth to water
11/4/2021	11:03	Begin purging well
11/4/2021	11:46	Collect sample MW-119S_110421
11/4/2021	12:00	End purge and turn off pump, begin decon of equipment
11/4/2021	12:20	Offsite
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--	--	-- Field staff signature:
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ARCADIS

SHALLOW LOW-FLOW GROUNDWATER SAMPLING FORM

Project No.	30080642.402.01	Well ID	MW-119S			Date	11-4-21
Project Name/Location		Ford LTP		Weather		Overcast	
Measuring Pt. Description	Top of Casing	Screen Setting (ft-bmp)	2.5-12.5	Casing Diameter (in.)	2	Well Material	PVC
Static Water Level (ft-bmp)	3.55	Total Depth (ft-bmp)	12.30	Water Column (ft.)	8.75	Gallons in Well	1.42
		Pump Intake (ft-bmp)	5.05	Purge Method	Low-Flow	Sample Method	Grab
		Well Volumes Purged	0.73				
Sample Time: Label	11:46	Volume Purged	1.04 gallons	Replicate/Code No.	--	Sampled by	Gary Schafer
Purge Start	11:03						
Purge End	12:00						

Time	Minutes Elapsed between Readings	Flow Rate (mL/min) [100-300 mL/min]	Depth to Water (ft) [± 0.3]	Total Gallons Purged	pH [± 0.1]	Cond. (mS/cm) [± 3%]	Turbidity (NTU) [± 10%*]	DO (mg/L) [± 10%]	Temp. (°C) [± 3%]	Redox (mV) [± 10mV]	Appearance	
											Color	Odor
11:05	0	100	3.55	0.00	6.45	0.95	3.84	2.08	14.6	141.2	Clear	No Odor
11:10	5	100	3.55	0.13	6.75	0.90	5.34	1.53	14.9	76.7	Clear	No Odor
11:15	5	100	3.55	0.26	6.82	0.87	5.94	1.47	14.9	57.8	Clear	No Odor
11:20	5	100	3.55	0.39	6.85	0.87	6.10	1.38	14.8	49.6	Clear	No Odor
11:25	5	100	3.55	0.52	6.87	0.87	6.13	1.30	14.9	47.4	Clear	No Odor
11:30	5	100	3.55	0.65	6.86	0.87	6.08	1.34	14.6	46.7	Clear	No Odor
11:35	5	100	3.55	0.78	6.90	0.88	4.98	1.28	14.8	43.3	Clear	No Odor
11:40	5	100	3.55	0.91	6.92	0.88	4.38	1.25	14.8	43.0	Clear	No Odor
11:45	5	100	3.55	1.04	6.93	0.90	4.09	1.23	14.8	44.4	Clear	No Odor
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* **Turbidity** < 50 NTU and ±10% or within 1 NTU of a previous reading when <10 NTU

Constituents Sampled	Container	Number	Preservative
1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, PCE, TCE, VC	40 mL Glass	3	HCL
1,4-dioxane	40 mL Glass	3	HCL

Comments

None

Well Casing Volumes

Gallons/Foot — *1" = 0.04* — *1.25" = 0.06* — *1.5" = 0.09* — *2" = 0.16* — *2.5" = 0.26* — *3" = 0.37* — *3.5" = 0.50* — *4" = 0.65* — *6" = 1.47*

Well Information

Well Location:	12034 Boston Post; north side of home	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Flush mount	Lock Functioning:	yes

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159525-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/22/2021 8:26:26 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159525-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159525-1

Job ID: 240-159525-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159525-1

Comments
No additional comments.

Receipt
The samples were received on 11/6/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.3º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159525-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159525-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159525-1	TRIP BLANK_43	Water	11/04/21 00:00	11/06/21 08:00
240-159525-2	MW-91S_110421	Water	11/04/21 09:45	11/06/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159525-1

Client Sample ID: TRIP BLANK_43 — Lab Sample ID: 240-159525-1

No Detections.

Client Sample ID: MW-91S_110421 — Lab Sample ID: 240-159525-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159525-1

Client Sample ID: TRIP BLANK_43
Date Collected: 11/04/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159525-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 23:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 23:52	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 23:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 23:52	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 23:52	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 23:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*62 - 137*		*11/12/21 23:52*	*1*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*		*11/12/21 23:52*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/12/21 23:52*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/12/21 23:52*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159525-1

Client Sample ID: MW-91S_110421
Date Collected: 11/04/21 09:45
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159525-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 04:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*11/12/21 04:13*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 00:14	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 00:14	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 00:14	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 00:14	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 00:14	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 00:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*		*11/13/21 00:14*	*1*
4-Bromofluorobenzene (Surr)	*79*		*56 - 136*		*11/13/21 00:14*	*1*
Toluene-d8 (Surr)	*107*		*78 - 122*		*11/13/21 00:14*	*1*
Dibromofluoromethane (Surr)	*97*		*73 - 120*		*11/13/21 00:14*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159525-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159525-1	TRIP BLANK_43	95	78	108	94
240-159525-2	MW-91S_110421	98	79	107	97
240-159536-A-3 MS	Matrix Spike	93	86	114	94
240-159536-E-3 MSD	Matrix Spike Duplicate	98	93	112	97
LCS 240-512748/4	Lab Control Sample	93	91	113	93
MB 240-512748/6	Method Blank	92	79	103	92

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159418-H-2 MS	Matrix Spike	82
240-159418-P-2 MSD	Matrix Spike Duplicate	83
240-159525-2	MW-91S_110421	82
LCS 240-512585/4	Lab Control Sample	81
MB 240-512585/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512748/6
Matrix: Water
Analysis Batch: 512748

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 23:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 23:07	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 23:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 23:07	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 23:07	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 23:07	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*		*11/12/21 23:07*	*1*
4-Bromofluorobenzene (Surr)	*79*		*56 - 136*		*11/12/21 23:07*	*1*
Toluene-d8 (Surr)	*103*		*78 - 122*		*11/12/21 23:07*	*1*
Dibromofluoromethane (Surr)	*92*		*73 - 120*		*11/12/21 23:07*	*1*

Lab Sample ID: LCS 240-512748/4
Matrix: Water
Analysis Batch: 512748

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.3		ug/L		103	63 - 134
cis-1,2-Dichloroethene	10.0	9.94		ug/L		99	77 - 123
Tetrachloroethene	10.0	10.8		ug/L		108	76 - 123
trans-1,2-Dichloroethene	10.0	10.1		ug/L		101	75 - 124
Trichloroethene	10.0	8.81		ug/L		88	70 - 122
Vinyl chloride	10.0	10.0		ug/L		100	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*91*		*56 - 136*
Toluene-d8 (Surr)	*113*		*78 - 122*
Dibromofluoromethane (Surr)	*93*		*73 - 120*

Lab Sample ID: 240-159536-A-3 MS
Matrix: Water
Analysis Batch: 512748

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.26		ug/L		93	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	10.1		ug/L		101	66 - 128
Tetrachloroethene	1.0	U	10.0	9.29		ug/L		93	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.49		ug/L		95	56 - 136
Trichloroethene	1.0	U	10.0	7.71		ug/L		77	61 - 124
Vinyl chloride	1.0	U	10.0	8.69		ug/L		87	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*86*		*56 - 136*
Toluene-d8 (Surr)	*114*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159536-A-3 MS
Matrix: Water
Analysis Batch: 512748

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	*94*		*73 - 120*

Lab Sample ID: 240-159536-E-3 MSD
Matrix: Water
Analysis Batch: 512748

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.41		ug/L		94	56 - 135	2	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.89		ug/L		99	66 - 128	2	14
Tetrachloroethene	1.0	U	10.0	9.07		ug/L		91	62 - 131	2	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.73		ug/L		97	56 - 136	2	15
Trichloroethene	1.0	U	10.0	7.96		ug/L		80	61 - 124	3	15
Vinyl chloride	1.0	U	10.0	9.96		ug/L		100	43 - 157	14	24

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*
4-Bromofluorobenzene (Surr)	*93*		*56 - 136*
Toluene-d8 (Surr)	*112*		*78 - 122*
Dibromofluoromethane (Surr)	*97*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512585/5
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/11/21 19:04	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/11/21 19:04*	*1*

Lab Sample ID: LCS 240-512585/4
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.86		ug/L		99	80 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*

Lab Sample ID: 240-159418-H-2 MS
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	11.1		ug/L		111	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159418-P-2 MSD
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.2		ug/L		102	51 - 153	8	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159525-1

GC/MS VOA

Analysis Batch: 512585

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159525-2	MW-91S_110421	Total/NA	Water	8260B SIM	
MB 240-512585/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512585/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159418-H-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159418-P-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 512748

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159525-1	TRIP BLANK_43	Total/NA	Water	8260B	
240-159525-2	MW-91S_110421	Total/NA	Water	8260B	
MB 240-512748/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512748/4	Lab Control Sample	Total/NA	Water	8260B	
240-159536-A-3 MS	Matrix Spike	Total/NA	Water	8260B	
240-159536-E-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159525-1

Client Sample ID: TRIP BLANK_43

Lab Sample ID: 240-159525-1

Date Collected: 11/04/21 00:00

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512748	11/12/21 23:52	LEE	TAL CAN

Client Sample ID: MW-91S_110421

Lab Sample ID: 240-159525-2

Date Collected: 11/04/21 09:45

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512748	11/13/21 00:14	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512585	11/12/21 04:13	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159525-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Sommer Guy	TAT if different from below: ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_43	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-91S_110421	11/4/21	9:45		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159525 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Sommer Guy	Arcadis	11/4/21 16:30	Novi, Cold Storage	Arcadis	11/4/21 16:30
[signature]	ARCADIS	11/5/21 1435	[signature]	ETA	11/5/21 1435
[signature]	ETA	11/5/21 1448	Received in Laboratory by: M. d. d.	Company: ETA	Date/Time: 11/6/21 8:00

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11/22/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 159525

Client ARCADIS Site Name

Cooler Received on 11/6/21 Opened on 11/6/21

Cooler unpacked by: Matthew Surma

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.2 °C Corrected Cooler Temp. 0.3 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# **HC157842**
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 01042016 (Yes) No
17. Was a LL Hg or Me Hg trip blank present? Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container.
Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.
Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

WI-NC-099

DATA VERIFICATION REPORT

November 22, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159525-1
Sample date: 2021-11-04
Report received by CADENA: 2021-11-22
Initial Data Verification completed by CADENA: 2021-11-22
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159525-1

		Sample Name:	TRIP BLANK_43				MW-91S_110421			
		Lab Sample ID:	2401595251				2401595252			
		Sample Date:	11/4/2021				11/4/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

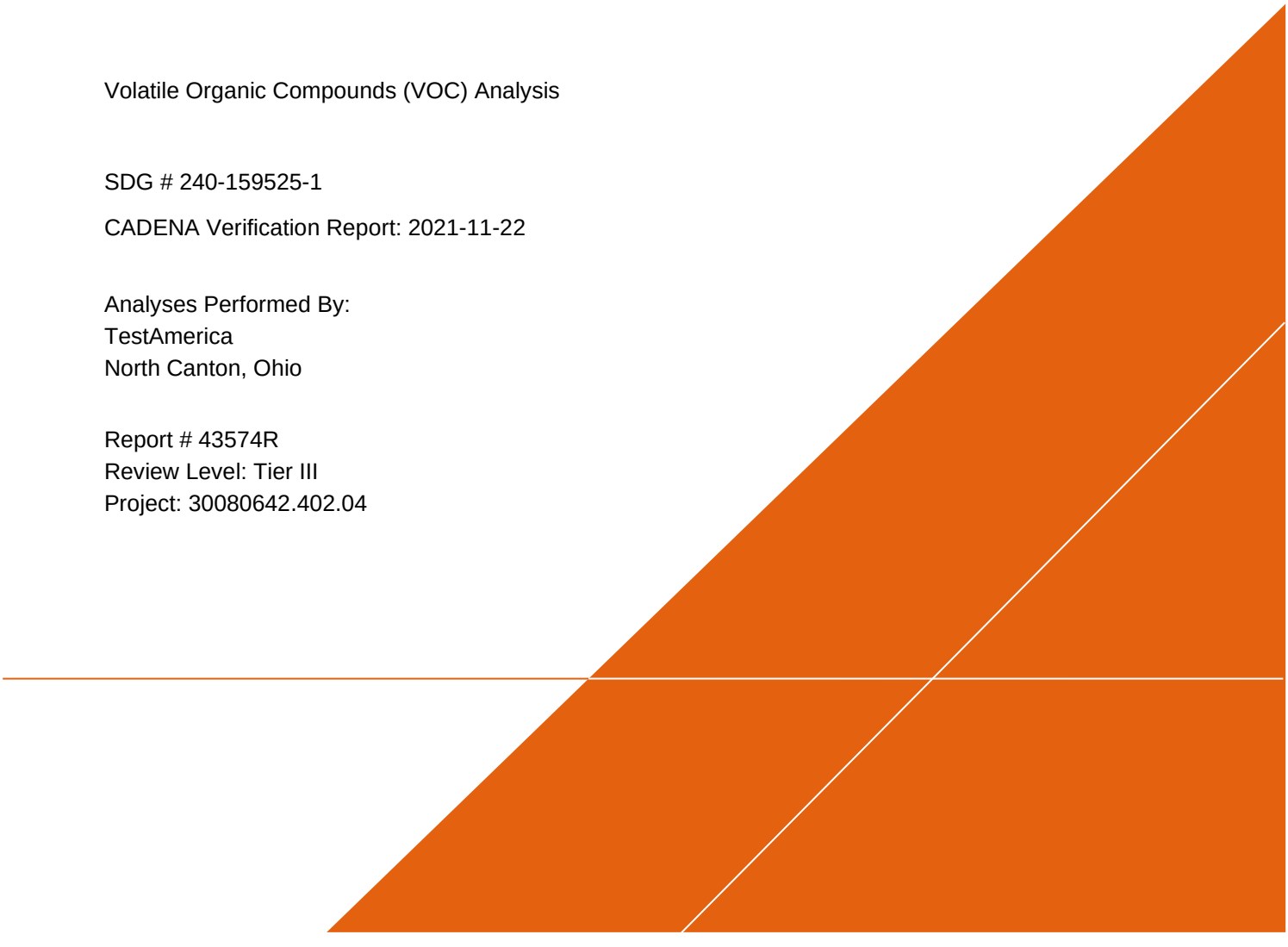
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159525-1

CADENA Verification Report: 2021-11-22

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43574R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159525-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_43	240-159525-1	Water	11/04/21		X	
MW-91S_110421	240-159525-2	Water	11/04/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

DATA REVIEW

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE: 

DATE: December 07, 2021

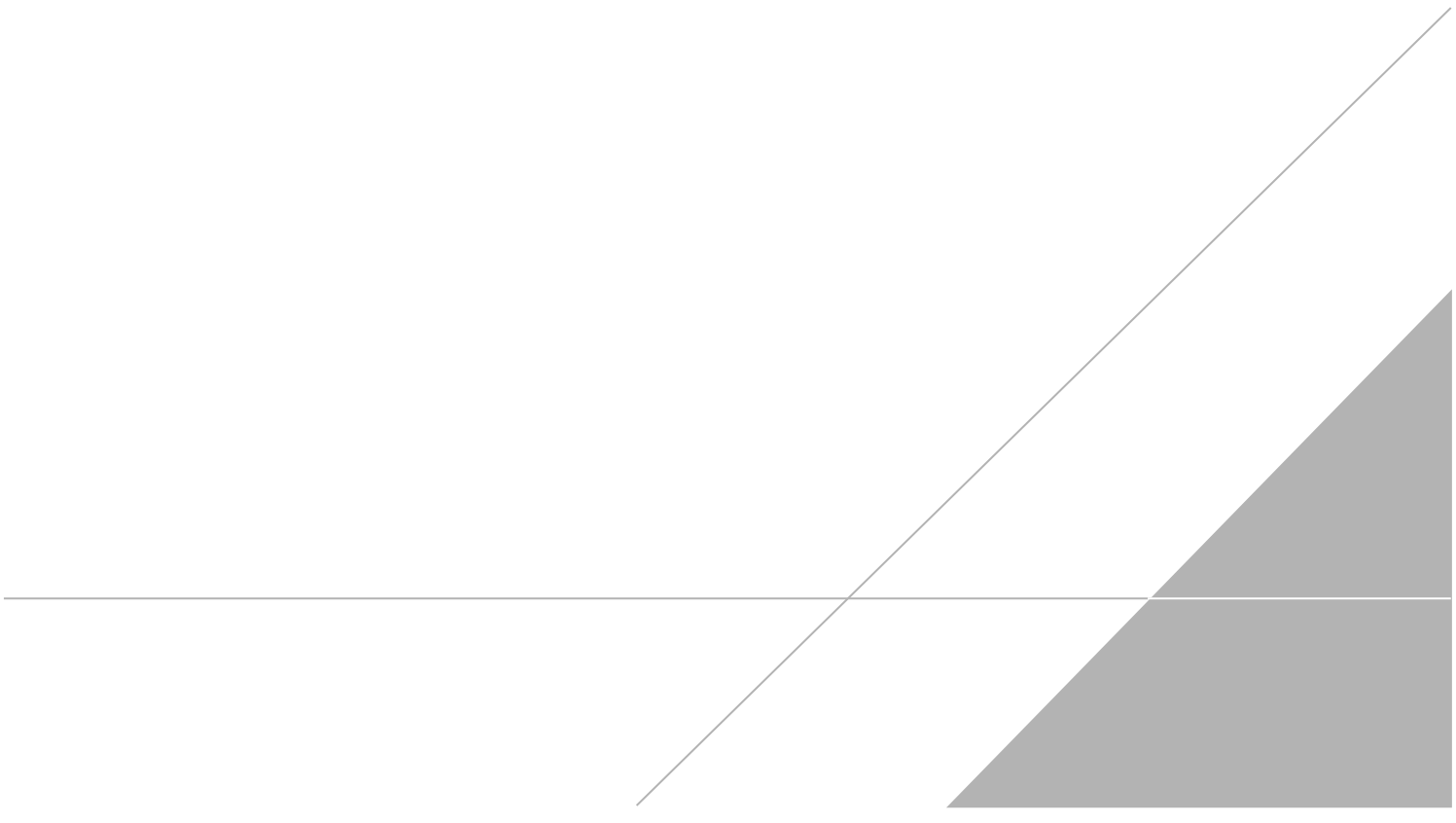
PEER REVIEW: Andrew Korycinski

DATE: December 8, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Sommer Guy	TAT if different from below: ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client:
Phone: 248-994-2240	Method of Shipment/Carrier:	10 day		Lab sampling:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_43	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-91S_110421	11/4/21	9:45		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159525 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Sommer Guy	Arcadis	11/4/21 16:30	Novi, Cold Storage	Arcadis	11/4/21 16:30
[signature]	ARCADIS	11/5/21 1435	[signature]	ETA	11/5/21 1435
[signature]	ETA	11/5/21 1448	Received in Laboratory by: M. d. d.	Company: ETA	Date/Time: 11/6/21 8:00

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11/22/2021

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159525-1

Client Sample ID: TRIP BLANK_43
Date Collected: 11/04/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159525-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/12/21 23:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/12/21 23:52	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 23:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/12/21 23:52	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/12/21 23:52	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/12/21 23:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*62 - 137*		*11/12/21 23:52*	*1*
4-Bromofluorobenzene (Surr)	*78*		*56 - 136*		*11/12/21 23:52*	*1*
Toluene-d8 (Surr)	*108*		*78 - 122*		*11/12/21 23:52*	*1*
Dibromofluoromethane (Surr)	*94*		*73 - 120*		*11/12/21 23:52*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159525-1

Client Sample ID: MW-91S_110421
Date Collected: 11/04/21 09:45
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159525-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 04:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*		*11/12/21 04:13*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 00:14	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 00:14	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 00:14	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 00:14	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 00:14	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 00:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*62 - 137*		*11/13/21 00:14*	*1*
4-Bromofluorobenzene (Surr)	*79*		*56 - 136*		*11/13/21 00:14*	*1*
Toluene-d8 (Surr)	*107*		*78 - 122*		*11/13/21 00:14*	*1*
Dibromofluoromethane (Surr)	*97*		*73 - 120*		*11/13/21 00:14*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159523-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
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Attn: Kristoffer Hinskey

Authorized for release by:
11/22/2021 8:25:56 AM

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Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159523-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159523-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159523-1

Comments
No additional comments.

Receipt
The samples were received on 11/6/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.0º C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) for analytical batch 512819 exceeded control criteria for Vinyl Chloride. The samples associated with this CCV were non-detect for the affected analytes. In accordance with the laboratory SOP, a low level CCV at the reporting limit (labeled as an MRL) was analyzed and the affected compounds were detected; therefore the data has been reported. No further corrective action was required.

TRIP BLANK_44 (240-159523-1) and MW-92S_110421 (240-159523-2)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159523-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159523-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159523-1	TRIP BLANK_44	Water	11/04/21 00:00	11/06/21 08:00
240-159523-2	MW-92S_110421	Water	11/04/21 11:15	11/06/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159523-1

Client Sample ID: TRIP BLANK_44 — Lab Sample ID: 240-159523-1

No Detections.

Client Sample ID: MW-92S_110421 — Lab Sample ID: 240-159523-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159523-1

Client Sample ID: TRIP BLANK_44
Date Collected: 11/04/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159523-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 20:08	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 20:08	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 20:08	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 20:08	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 20:08	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 20:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*127*		*62 - 137*		*11/13/21 20:08*	*1*
4-Bromofluorobenzene (Surr)	*67*		*56 - 136*		*11/13/21 20:08*	*1*
Toluene-d8 (Surr)	*86*		*78 - 122*		*11/13/21 20:08*	*1*
Dibromofluoromethane (Surr)	*110*		*73 - 120*		*11/13/21 20:08*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159523-1

Client Sample ID: MW-92S_110421
Date Collected: 11/04/21 11:15
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159523-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 03:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*11/12/21 03:49*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 20:30	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 20:30	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 20:30	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 20:30	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 20:30	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 20:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*129*		*62 - 137*		*11/13/21 20:30*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/13/21 20:30*	*1*
Toluene-d8 (Surr)	*86*		*78 - 122*		*11/13/21 20:30*	*1*
Dibromofluoromethane (Surr)	*115*		*73 - 120*		*11/13/21 20:30*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159523-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159523-1	TRIP BLANK_44	127	67	86	110
240-159523-2	MW-92S_110421	129	70	86	115
240-159546-H-2 MSD	Matrix Spike Duplicate	102	98	101	91
240-159546-K-2 MS	Matrix Spike	105	96	102	93
LCS 240-512819/4	Lab Control Sample	100	99	100	91
MB 240-512819/7	Method Blank	119	75	89	102

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159418-H-2 MS	Matrix Spike	82
240-159418-P-2 MSD	Matrix Spike Duplicate	83
240-159523-2	MW-92S_110421	83
LCS 240-512585/4	Lab Control Sample	81
MB 240-512585/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512819/7
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 13:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 13:57	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 13:57	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:57	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 13:57	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*62 - 137*		*11/13/21 13:57*	*1*
4-Bromofluorobenzene (Surr)	*75*		*56 - 136*		*11/13/21 13:57*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/13/21 13:57*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/13/21 13:57*	*1*

Lab Sample ID: LCS 240-512819/4
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.01		ug/L		90	63 - 134
cis-1,2-Dichloroethene	10.0	10.7		ug/L		107	77 - 123
Tetrachloroethene	10.0	9.49		ug/L		95	76 - 123
trans-1,2-Dichloroethene	10.0	11.0		ug/L		110	75 - 124
Trichloroethene	10.0	9.48		ug/L		95	70 - 122
Vinyl chloride	10.0	8.38		ug/L		84	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*99*		*56 - 136*
Toluene-d8 (Surr)	*100*		*78 - 122*
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Lab Sample ID: 240-159546-H-2 MSD
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	8.50		ug/L		85	56 - 135	11	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.62		ug/L		96	66 - 128	1	14
Tetrachloroethene	1.0	U	10.0	8.67		ug/L		87	62 - 131	16	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.76		ug/L		98	56 - 136	3	15
Trichloroethene	1.0	U	10.0	8.44		ug/L		84	61 - 124	9	15
Vinyl chloride	1.0	U	10.0	7.09		ug/L		71	43 - 157	3	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*
4-Bromofluorobenzene (Surr)	*98*		*56 - 136*
Toluene-d8 (Surr)	*101*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159546-H-2 MSD
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Lab Sample ID: 240-159546-K-2 MS
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	7.61		ug/L		76	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.48		ug/L		95	66 - 128
Tetrachloroethene	1.0	U	10.0	7.41		ug/L		74	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.49		ug/L		95	56 - 136
Trichloroethene	1.0	U	10.0	7.75		ug/L		77	61 - 124
Vinyl chloride	1.0	U	10.0	7.30		ug/L		73	43 - 157

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*
4-Bromofluorobenzene (Surr)	*96*		*56 - 136*
Toluene-d8 (Surr)	*102*		*78 - 122*
Dibromofluoromethane (Surr)	*93*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512585/5
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/11/21 19:04	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/11/21 19:04*	*1*

Lab Sample ID: LCS 240-512585/4
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.86		ug/L		99	80 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*

Lab Sample ID: 240-159418-H-2 MS
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	11.1		ug/L		111	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159418-P-2 MSD
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.2		ug/L		102	51 - 153	8	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159523-1

GC/MS VOA

Analysis Batch: 512585

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159523-2	MW-92S_110421	Total/NA	Water	8260B SIM	
MB 240-512585/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512585/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159418-H-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159418-P-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 512819

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159523-1	TRIP BLANK_44	Total/NA	Water	8260B	
240-159523-2	MW-92S_110421	Total/NA	Water	8260B	
MB 240-512819/7	Method Blank	Total/NA	Water	8260B	
LCS 240-512819/4	Lab Control Sample	Total/NA	Water	8260B	
240-159546-H-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	
240-159546-K-2 MS	Matrix Spike	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159523-1

Client Sample ID: TRIP BLANK_44

Lab Sample ID: 240-159523-1

Date Collected: 11/04/21 00:00

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512819	11/13/21 20:08	LEE	TAL CAN

Client Sample ID: MW-92S_110421

Lab Sample ID: 240-159523-2

Date Collected: 11/04/21 11:15

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512819	11/13/21 20:30	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512585	11/12/21 03:49	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159523-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN
190

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Sommer Guy	TAT if different from below: ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:	10 day		Lab sampling:
Project Number: 30080642.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_44	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-925_110421	11/4/21	11:15		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159523 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Sommer Guy	Arcadis	11/4/21 16:30	Novi Cold Storage	Arcadis	11/4/21 16:30
[illegible]	Arcadis	11/5/21 1435	[illegible]	ETA	11/5/21 1435
[illegible]	ETA	11-5-21 1448	Received in Laboratory by: M.A.S.	ETA	Date/Time: 11/6/21 8:00

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11/22/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 159523

Client ARCADIS Site Name _____

Cooler Received on 11/6/21 Opened on 11/6/21

Cooler unpacked by: Matthew Surma

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.9 °C Corrected Cooler Temp. 1.0 °C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   - Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   - Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   - Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)

If yes, Questions 13-17 have been checked at the originating laboratory.

13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# HC157842
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 0104201G (Yes) No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes (No)

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by: [signature]

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

WI-NC-099

DATA VERIFICATION REPORT

November 22, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159523-1
Sample date: 2021-11-04
Report received by CADENA: 2021-11-22
Initial Data Verification completed by CADENA: 2021-11-22
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159523-1

		Sample Name:	TRIP BLANK_44				MW-92S_110421			
		Lab Sample ID:	2401595231				2401595232			
		Sample Date:	11/4/2021				11/4/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

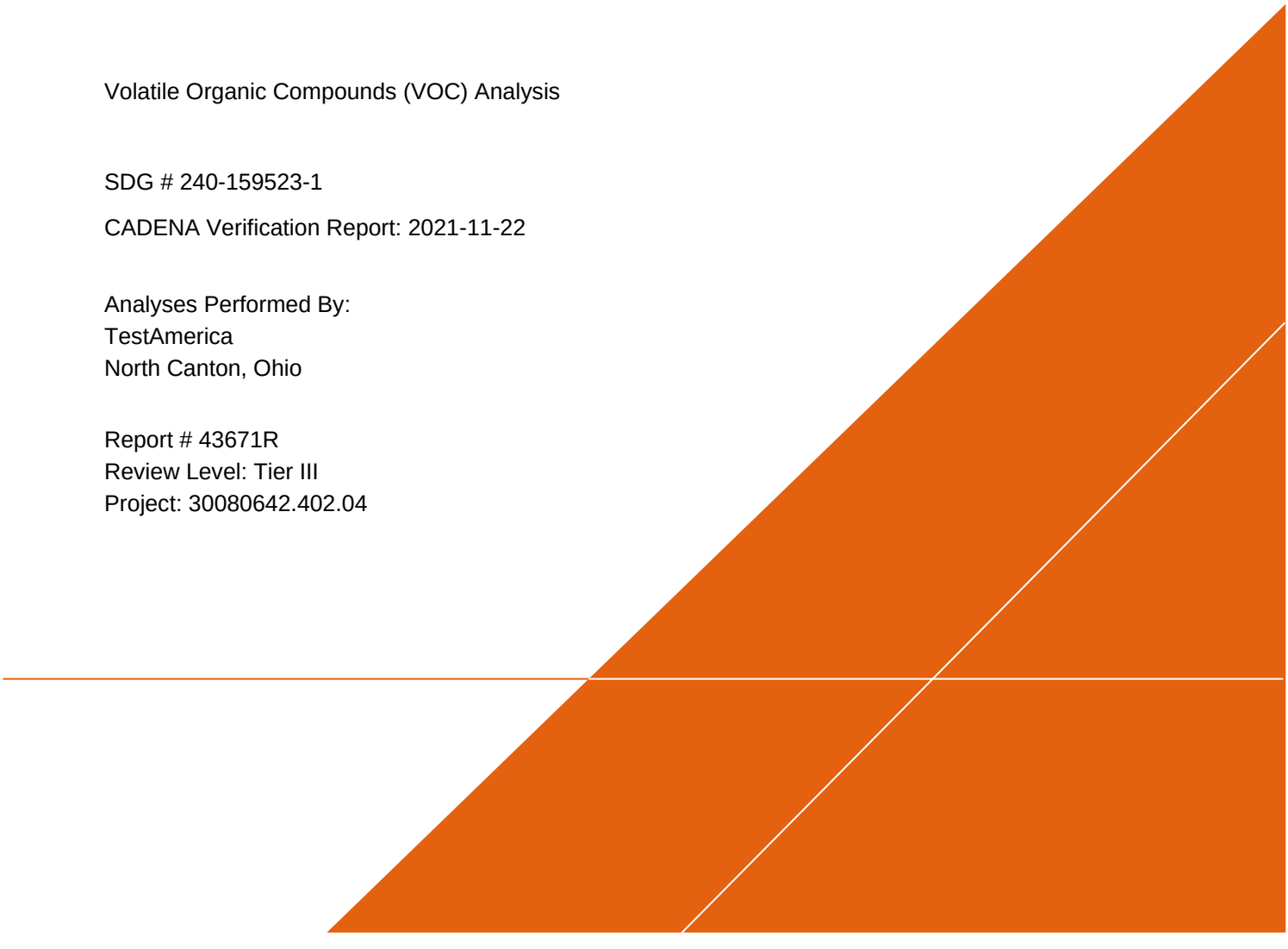
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159523-1

CADENA Verification Report: 2021-11-22

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43671R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159523-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_44	240-159523-1	Water	11/04/21		X	
MW-92S_110421	240-159523-2	Water	11/04/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Compound	Criteria
TRIP BLANK_44 MW-92S_110421	Continuous Calibration Verification %D	Vinyl chloride	-21.2%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	

Initial/Continuing	Criteria	Sample Result	Qualification
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 09, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 09, 2021

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Sommer Guy	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client:
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_44	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-925_110421	11/4/21	11:15		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159523 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Sommer Guy	Arcadis	11/4/21 16:30	Novi Cold storage	Arcadis	11/4/21 16:30
[illegible]	Arcadis	11/5/21 1435	[illegible]	ETA	11/5/21 1435
[illegible]	ETA	11-5-21 1448	Received in Laboratory by: M.A.A.	ETA	11/6/21 8:00

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11/22/2021

Client Sample ID: TRIP BLANK_44
Lab Sample ID: 240-159523-1
Date Collected: 11/04/21 00:00
Matrix: Water
Date Received: 11/06/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 20:08	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 20:08	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 20:08	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 20:08	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 20:08	1
Vinyl chloride	1.0	~~U~~ UJ	1.0	0.45	ug/L			11/13/21 20:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*127*		*62 - 137*		*11/13/21 20:08*	*1*
4-Bromofluorobenzene (Surr)	*67*		*56 - 136*		*11/13/21 20:08*	*1*
Toluene-d8 (Surr)	*86*		*78 - 122*		*11/13/21 20:08*	*1*
Dibromofluoromethane (Surr)	*110*		*73 - 120*		*11/13/21 20:08*	*1*

Client Sample ID: MW-92S_110421
Lab Sample ID: 240-159523-2
Date Collected: 11/04/21 11:15
Matrix: Water
Date Received: 11/06/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 03:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*11/12/21 03:49*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 20:30	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 20:30	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 20:30	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 20:30	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 20:30	1
Vinyl chloride	1.0	~~U~~ UJ	1.0	0.45	ug/L			11/13/21 20:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*129*		*62 - 137*		*11/13/21 20:30*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/13/21 20:30*	*1*
Toluene-d8 (Surr)	*86*		*78 - 122*		*11/13/21 20:30*	*1*
Dibromofluoromethane (Surr)	*115*		*73 - 120*		*11/13/21 20:30*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159628-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/23/2021 9:17:47 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159628-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-159628-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159628-1

Comments
No additional comments.

Receipt
The samples were received on 11/9/2021 10:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 3.7° C and 3.8° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159628-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159628-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159628-1	TRIP BLANK_76	Water	11/05/21 00:00	11/09/21 10:00
240-159628-2	MW-111S_110521	Water	11/05/21 14:50	11/09/21 10:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159628-1

Client Sample ID: TRIP BLANK_76 — Lab Sample ID: 240-159628-1

No Detections.

Client Sample ID: MW-111S_110521 — Lab Sample ID: 240-159628-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159628-1

Client Sample ID: TRIP BLANK_76
Date Collected: 11/05/21 00:00
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159628-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 18:11	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 18:11	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 18:11	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 18:11	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 18:11	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 18:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/17/21 18:11*	*1*
4-Bromofluorobenzene (Surr)	*86*		*56 - 136*		*11/17/21 18:11*	*1*
Toluene-d8 (Surr)	*96*		*78 - 122*		*11/17/21 18:11*	*1*
Dibromofluoromethane (Surr)	*103*		*73 - 120*		*11/17/21 18:11*	*1*

Client Sample ID: MW-111S_110521
Date Collected: 11/05/21 14:50
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159628-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 00:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*66 - 120*		*11/17/21 00:11*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 18:58	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 18:58	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 18:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 18:58	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 18:58	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 18:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*11/17/21 18:58*	*1*
4-Bromofluorobenzene (Surr)	*91*		*56 - 136*		*11/17/21 18:58*	*1*
Toluene-d8 (Surr)	*98*		*78 - 122*		*11/17/21 18:58*	*1*
Dibromofluoromethane (Surr)	*111*		*73 - 120*		*11/17/21 18:58*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159628-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159628-1	TRIP BLANK_76	93	86	96	103
240-159628-2	MW-111S_110521	96	91	98	111
240-160104-A-1 MS	Matrix Spike	89	90	100	100
240-160104-A-1 MSD	Matrix Spike Duplicate	86	91	101	99
LCS 240-513357/12	Lab Control Sample	93	92	100	104
MB 240-513357/8	Method Blank	101	91	99	115

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159546-G-2 MS	Matrix Spike	82
240-159546-M-2 MSD	Matrix Spike Duplicate	85
240-159628-2	MW-111S_110521	86
LCS 240-513286/4	Lab Control Sample	82
MB 240-513286/5	Method Blank	85

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513357/8
Matrix: Water
Analysis Batch: 513357

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 14:12	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 14:12	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 14:12	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 14:12	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 14:12	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 14:12	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*62 - 137*		*11/17/21 14:12*	*1*
4-Bromofluorobenzene (Surr)	*91*		*56 - 136*		*11/17/21 14:12*	*1*
Toluene-d8 (Surr)	*99*		*78 - 122*		*11/17/21 14:12*	*1*
Dibromofluoromethane (Surr)	*115*		*73 - 120*		*11/17/21 14:12*	*1*

Lab Sample ID: LCS 240-513357/12
Matrix: Water
Analysis Batch: 513357

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	29.1		ug/L		116	63 - 134
cis-1,2-Dichloroethene	25.0	28.2		ug/L		113	77 - 123
Tetrachloroethene	25.0	30.5		ug/L		122	76 - 123
trans-1,2-Dichloroethene	25.0	28.7		ug/L		115	75 - 124
Trichloroethene	25.0	29.7		ug/L		119	70 - 122
Vinyl chloride	25.0	25.2		ug/L		101	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*92*		*56 - 136*
Toluene-d8 (Surr)	*100*		*78 - 122*
Dibromofluoromethane (Surr)	*104*		*73 - 120*

Lab Sample ID: 240-160104-A-1 MS
Matrix: Water
Analysis Batch: 513357

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	40	U	1000	1170		ug/L		117	56 - 135
cis-1,2-Dichloroethene	40	U	1000	1100		ug/L		110	66 - 128
Tetrachloroethene	40	U	1000	1220		ug/L		122	62 - 131
trans-1,2-Dichloroethene	40	U	1000	1110		ug/L		111	56 - 136
Trichloroethene	40	U	1000	1140		ug/L		114	61 - 124
Vinyl chloride	110		1000	1070		ug/L		96	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*62 - 137*
4-Bromofluorobenzene (Surr)	*90*		*56 - 136*
Toluene-d8 (Surr)	*100*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-160104-A-1 MS
Matrix: Water
Analysis Batch: 513357

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*100*		*73 - 120*

Lab Sample ID: 240-160104-A-1 MSD
Matrix: Water
Analysis Batch: 513357

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	40	U	1000	1170		ug/L		117	56 - 135	1	26
cis-1,2-Dichloroethene	40	U	1000	1080		ug/L		108	66 - 128	2	14
Tetrachloroethene	40	U	1000	1240		ug/L		124	62 - 131	2	20
trans-1,2-Dichloroethene	40	U	1000	1100		ug/L		110	56 - 136	1	15
Trichloroethene	40	U	1000	1130		ug/L		113	61 - 124	1	15
Vinyl chloride	110		1000	1080		ug/L		97	43 - 157	1	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*
4-Bromofluorobenzene (Surr)	*91*		*56 - 136*
Toluene-d8 (Surr)	*101*		*78 - 122*
Dibromofluoromethane (Surr)	*99*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513286/5
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/16/21 19:44	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/16/21 19:44*	*1*

Lab Sample ID: LCS 240-513286/4
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.78		ug/L		98	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159546-G-2 MS
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	11.0		ug/L		110	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159546-M-2 MSD
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.83		ug/L		98	51 - 153	11	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159628-1

GC/MS VOA

Analysis Batch: 513286

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159628-2	MW-111S_110521	Total/NA	Water	8260B SIM	
MB 240-513286/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513286/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159546-G-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159546-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513357

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159628-1	TRIP BLANK_76	Total/NA	Water	8260B	
240-159628-2	MW-111S_110521	Total/NA	Water	8260B	
MB 240-513357/8	Method Blank	Total/NA	Water	8260B	
LCS 240-513357/12	Lab Control Sample	Total/NA	Water	8260B	
240-160104-A-1 MS	Matrix Spike	Total/NA	Water	8260B	
240-160104-A-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159628-1

Client Sample ID: TRIP BLANK_76

Lab Sample ID: 240-159628-1

Date Collected: 11/05/21 00:00
Matrix: Water
Date Received: 11/09/21 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513357	11/17/21 18:11	SAM	TAL CAN

Client Sample ID: MW-111S_110521

Lab Sample ID: 240-159628-2

Date Collected: 11/05/21 14:50
Matrix: Water
Date Received: 11/09/21 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513357	11/17/21 18:58	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	513286	11/17/21 00:11	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159628-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

MICHIGAN 190

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Samantha Mirelli / COURIER: CHRISTINA WEAVER	TAT if different from below: 10 day; 3 weeks; 2 weeks; 1 week; 2 days; 1 day		Walk-in client; Lab sampling
Phone: 248-994-2240	Method of Shipment/Carrier:			Job/SDG No:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_ 76	—	—		X						1							X	X	X	X	X	X	X	1 Trip Blank
MW-111S_110521	11/5/21	14:50		6						6							X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159628 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
SM	Arcadis	11/5/21 16:30	NOVI COLD STORAGE	ARCADIS	11/5/21 / 16:30
	ARCADIS	11/8/21 / 1200		ETA	11/8/21 / 1200
	ETA	11/9/21	Received in Laboratory by:	ETA	11-9-21 1000

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 159628
Canton Facility

Client ARCADIS Site Name _____ Cooler unpacked by: Tammy Dayer

Cooler Received on 11-9-21 Opened on 11-9-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 2 Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
   -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? Yes No
11. Sufficient quantity received to perform indicated analyses? Yes No
12. Are these work share samples and all listed on the COC? Yes No
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# **HC157842**
14. Were VOAs on the COC? Yes No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 60358 Yes No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page Samples processed by:

The TB is not logged for SIM ~~due to insufficient volume.~~ per corrected COC. [initials] 11/11/21 ~~[initials] 11-9-21~~

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

WI-NC-099

Login # : 159628

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form				
Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
(TA) Client Box Other	(IR-14) IR-15	3.6	3.7	(Wet Ice) Blue Ice Dry Ice Water None
(TA) Client Box Other	(IR-14) IR-15	3.7	3.8	(Wet Ice) Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice

DATA VERIFICATION REPORT

November 23, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159628-1
Sample date: 2021-11-05
Report received by CADENA: 2021-11-23
Initial Data Verification completed by CADENA: 2021-11-23
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159628-1

		Sample Name:	TRIP BLANK_76				MW-111S_110521			
		Lab Sample ID:	2401596281				2401596282			
		Sample Date:	11/5/2021				11/5/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

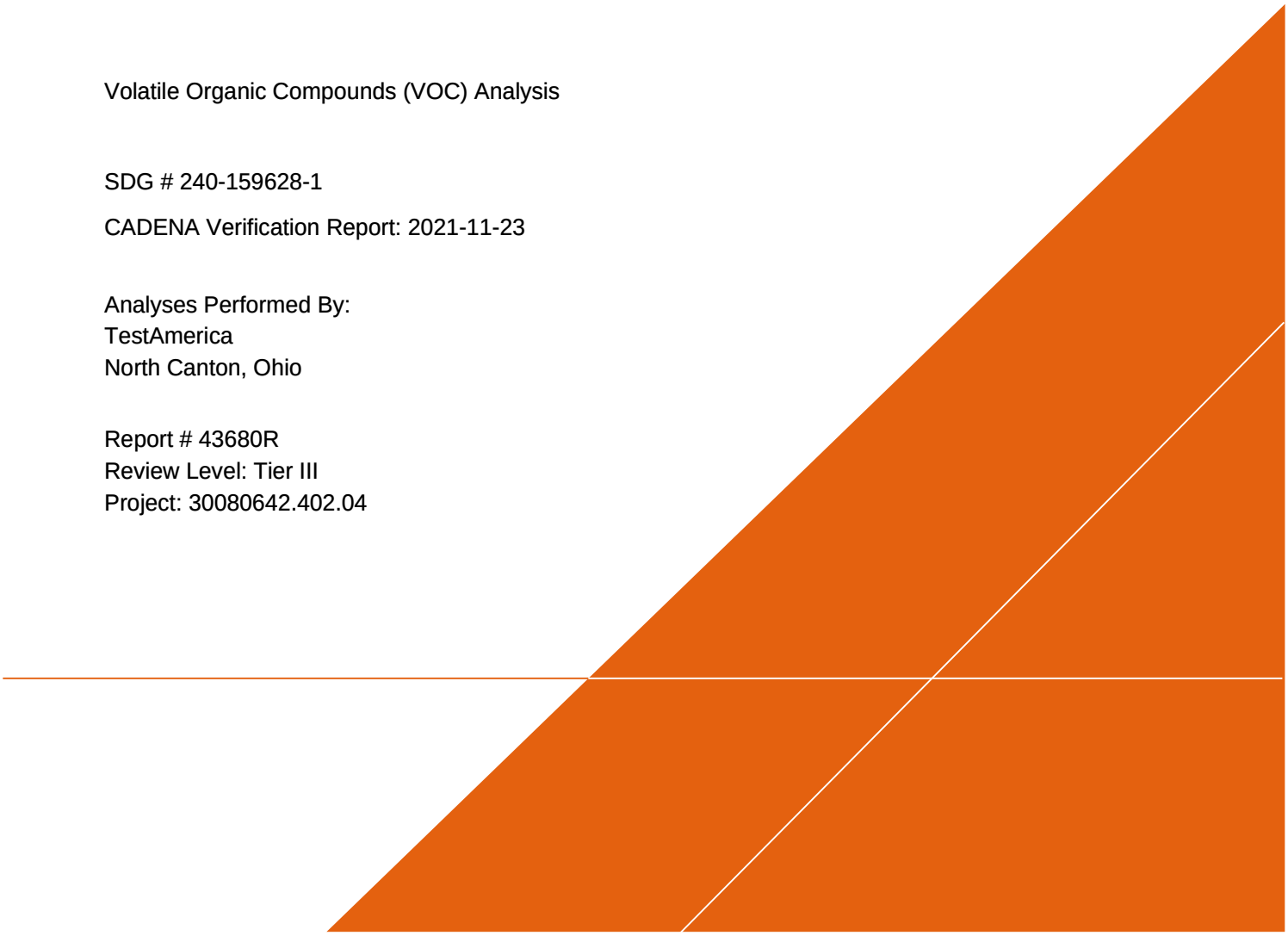
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159628-1

CADENA Verification Report: 2021-11-23

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43680R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159628-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_76	240-159628-1	Water	11/05/21		X	
MW-111S_110521	240-159628-2	Water	11/05/21		X	X

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Compound	Criteria
TRIP BLANK_76 MW-111S_110521	Continuous Calibration Verification %D	Tetrachloroethene	+20.5%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	

Initial/Continuing	Criteria	Sample Result	Qualification
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 10, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 14, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Samantha Mitchell		
Project Name: Ford LTP Off-Site	COURIER: CHRISTINA WEAVER		
Project Number: 30080642.402.04	Method of Shipment/Carrier:		
PO # 30080642.402.04	Shipping/Tracking No:		

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below

10 day — 3 weeks, 2 weeks, 1 week, 2 days, 1 day

Analyses

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM					Sample Specific Notes / Special Instructions:
TRIP BLANK_ 76	—	—		X						1							X	X	X	X	X	X	~~X~~					1 Trip Blank
MW-111S_110521	11/5/21	14:50		6						6							X	X	X	X	X	X	X					3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159628 Chain of Custody

Possible Hazard Identification: Non-Hazard, Flammable, Skin Irritant, Poison B, Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client, Disposal By Lab, Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
SH / Christina Weaver	Arcadis	11/5/21 16:30	NOVI COLD STORAGE	ARCADIS	11/5/21 / 16:30
Christina Weaver	ARCADIS	11/8/21 / 1200	[signature]	ETA	11/8/21 / 1200
[signature]	ETA	11/9/21	Received in Laboratory by: [signature]	ETA	11-9-21 1000

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Client Sample ID: TRIP BLANK_76
Lab Sample ID: 240-159628-1

Date Collected: 11/05/21 00:00
Matrix: Water
Date Received: 11/09/21 10:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 18:11	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 18:11	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 18:11	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 18:11	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 18:11	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 18:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/17/21 18:11*	
4-Bromofluorobenzene (Surr)	*86*		*56 - 136*		*11/17/21 18:11*	
Toluene-d8 (Surr)	*96*		*78 - 122*		*11/17/21 18:11*	
Dibromofluoromethane (Surr)	*103*		*73 - 120*		*11/17/21 18:11*	

Client Sample ID: MW-111S_110521
Lab Sample ID: 240-159628-2

Date Collected: 11/05/21 14:50
Matrix: Water
Date Received: 11/09/21 10:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/17/21 00:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*66 - 120*		*11/17/21 00:11*	

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/17/21 18:58	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/17/21 18:58	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 18:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/17/21 18:58	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/17/21 18:58	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/17/21 18:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*11/17/21 18:58*	
4-Bromofluorobenzene (Surr)	*91*		*56 - 136*		*11/17/21 18:58*	
Toluene-d8 (Surr)	*98*		*78 - 122*		*11/17/21 18:58*	
Dibromofluoromethane (Surr)			*73 - 120*		*11/17/21 18:58*	

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159512-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/22/2021 7:51:38 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159512-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159512-1

Job ID: 240-159512-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159512-1

Comments
No additional comments.

Receipt
The samples were received on 11/6/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.4º C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) for analytical batch 512819 exceeded control criteria for Vinyl Chloride. The samples associated with this CCV were non-detect for the affected analytes. In accordance with the laboratory SOP, a low level CCV at the reporting limit (labeled as an MRL) was analyzed and the affected compounds were detected; therefore the data has been reported. No further corrective action was required: TRIP BLANK_45 (240-159512-1) and MW-155S_110421 (240-159512-2).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159512-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159512-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159512-1	TRIP BLANK_45	Water	11/04/21 00:00	11/06/21 08:00
240-159512-2	MW-155S_110421	Water	11/04/21 15:11	11/06/21 08:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159512-1

Client Sample ID: TRIP BLANK_45 — Lab Sample ID: 240-159512-1

No Detections.

Client Sample ID: MW-155S_110421 — Lab Sample ID: 240-159512-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159512-1

Client Sample ID: TRIP BLANK_45
Date Collected: 11/04/21 00:00
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159512-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 15:02	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 15:02	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 15:02	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 15:02	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 15:02	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 15:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*121*		*62 - 137*		*11/13/21 15:02*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/13/21 15:02*	*1*
Toluene-d8 (Surr)	*87*		*78 - 122*		*11/13/21 15:02*	*1*
Dibromofluoromethane (Surr)	*108*		*73 - 120*		*11/13/21 15:02*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159512-1

Client Sample ID: MW-155S_110421
Date Collected: 11/04/21 15:11
Date Received: 11/06/21 08:00

Lab Sample ID: 240-159512-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 01:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*11/12/21 01:02*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 15:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 15:24	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 15:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 15:24	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 15:24	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 15:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*126*		*62 - 137*		*11/13/21 15:24*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/13/21 15:24*	*1*
Toluene-d8 (Surr)	*87*		*78 - 122*		*11/13/21 15:24*	*1*
Dibromofluoromethane (Surr)	*109*		*73 - 120*		*11/13/21 15:24*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159512-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159512-1	TRIP BLANK_45	121	70	87	108
240-159512-2	MW-155S_110421	126	70	87	109
240-159546-H-2 MSD	Matrix Spike Duplicate	102	98	101	91
240-159546-K-2 MS	Matrix Spike	105	96	102	93
LCS 240-512819/4	Lab Control Sample	100	99	100	91
MB 240-512819/7	Method Blank	119	75	89	102

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159418-H-2 MS	Matrix Spike	82
240-159418-P-2 MSD	Matrix Spike Duplicate	83
240-159512-2	MW-155S_110421	83
LCS 240-512585/4	Lab Control Sample	81
MB 240-512585/5	Method Blank	84

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512819/7
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 13:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 13:57	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 13:57	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 13:57	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 13:57	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*62 - 137*		*11/13/21 13:57*	*1*
4-Bromofluorobenzene (Surr)	*75*		*56 - 136*		*11/13/21 13:57*	*1*
Toluene-d8 (Surr)	*89*		*78 - 122*		*11/13/21 13:57*	*1*
Dibromofluoromethane (Surr)	*102*		*73 - 120*		*11/13/21 13:57*	*1*

Lab Sample ID: LCS 240-512819/4
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.01		ug/L		90	63 - 134
cis-1,2-Dichloroethene	10.0	10.7		ug/L		107	77 - 123
Tetrachloroethene	10.0	9.49		ug/L		95	76 - 123
trans-1,2-Dichloroethene	10.0	11.0		ug/L		110	75 - 124
Trichloroethene	10.0	9.48		ug/L		95	70 - 122
Vinyl chloride	10.0	8.38		ug/L		84	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*62 - 137*
4-Bromofluorobenzene (Surr)	*99*		*56 - 136*
Toluene-d8 (Surr)	*100*		*78 - 122*
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Lab Sample ID: 240-159546-H-2 MSD
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	8.50		ug/L		85	56 - 135	11	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.62		ug/L		96	66 - 128	1	14
Tetrachloroethene	1.0	U	10.0	8.67		ug/L		87	62 - 131	16	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.76		ug/L		98	56 - 136	3	15
Trichloroethene	1.0	U	10.0	8.44		ug/L		84	61 - 124	9	15
Vinyl chloride	1.0	U	10.0	7.09		ug/L		71	43 - 157	3	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*62 - 137*
4-Bromofluorobenzene (Surr)	*98*		*56 - 136*
Toluene-d8 (Surr)	*101*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159546-H-2 MSD
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
Dibromofluoromethane (Surr)	*91*		*73 - 120*

Lab Sample ID: 240-159546-K-2 MS
Matrix: Water
Analysis Batch: 512819

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	7.61		ug/L		76	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.48		ug/L		95	66 - 128
Tetrachloroethene	1.0	U	10.0	7.41		ug/L		74	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.49		ug/L		95	56 - 136
Trichloroethene	1.0	U	10.0	7.75		ug/L		77	61 - 124
Vinyl chloride	1.0	U	10.0	7.30		ug/L		73	43 - 157

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*105*		*62 - 137*
4-Bromofluorobenzene (Surr)	*96*		*56 - 136*
Toluene-d8 (Surr)	*102*		*78 - 122*
Dibromofluoromethane (Surr)	*93*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-512585/5
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/11/21 19:04	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/11/21 19:04*	*1*

Lab Sample ID: LCS 240-512585/4
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.86		ug/L		99	80 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*66 - 120*

Lab Sample ID: 240-159418-H-2 MS
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	11.1		ug/L		111	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159418-P-2 MSD
Matrix: Water
Analysis Batch: 512585

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	10.2		ug/L		102	51 - 153	8	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159512-1

GC/MS VOA

Analysis Batch: 512585

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159512-2	MW-155S_110421	Total/NA	Water	8260B SIM	
MB 240-512585/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512585/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159418-H-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159418-P-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 512819

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159512-1	TRIP BLANK_45	Total/NA	Water	8260B	
240-159512-2	MW-155S_110421	Total/NA	Water	8260B	
MB 240-512819/7	Method Blank	Total/NA	Water	8260B	
LCS 240-512819/4	Lab Control Sample	Total/NA	Water	8260B	
240-159546-H-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	
240-159546-K-2 MS	Matrix Spike	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159512-1

Client Sample ID: TRIP BLANK_45

Lab Sample ID: 240-159512-1

Date Collected: 11/04/21 00:00

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512819	11/13/21 15:02	LEE	TAL CAN

Client Sample ID: MW-155S_110421

Lab Sample ID: 240-159512-2

Date Collected: 11/04/21 15:11

Matrix: Water

Date Received: 11/06/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512819	11/13/21 15:24	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	512585	11/12/21 01:02	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159512-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client:
Phone: 248-994-2240	Method of Shipment/Carrier:	10 day		Lab sampling:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM				Sample Specific Notes / Special Instructions:
TRIP BLANK_45	---	---		X						1					N	G	X	X	X	X	X	X	X				1 Trip Blank
MW-155S_110421	11/04/21	1511		X						6					N	G	X	X	X	X	X	X	X				3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159512 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalla@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time	Received by	Company	Date/Time
Relinquished by: Gary Schafer	Arcadis	11/04/21 1605	Novi cold storage	Arcadis	11/04/21 1608
Relinquished by:	ARCADIS	11/5/21 / 1435	Jeri Hare	ETA	11/5/21 1435
Relinquished by: Jeri Hare	ETA	11/5/21 1448	Received in Laboratory by: M. ★. ★.	ETA	11/6/21 8:00

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11/22/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 159512

Client ARCADIS Site Name

Cooler unpacked by: Matthew Surma

Cooler Received on 11/6/21 Opened on 11/6/21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. 0.3 °C Corrected Cooler Temp. 0.4 °C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# HC157842
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 0104201G (Yes) No
17. Was a LL Hg or Me Hg trip blank present? ____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

WI-NC-099

DATA VERIFICATION REPORT

November 22, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159512-1
Sample date: 2021-11-04
Report received by CADENA: 2021-11-22
Initial Data Verification completed by CADENA: 2021-11-22
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159512-1

		Sample Name:	TRIP BLANK_45				MW-155S_110421			
		Lab Sample ID:	2401595121				2401595122			
		Sample Date:	11/4/2021				11/4/2021			
	Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC										
	OSW-8260B									
	1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	OSW-8260BBSim									
	1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

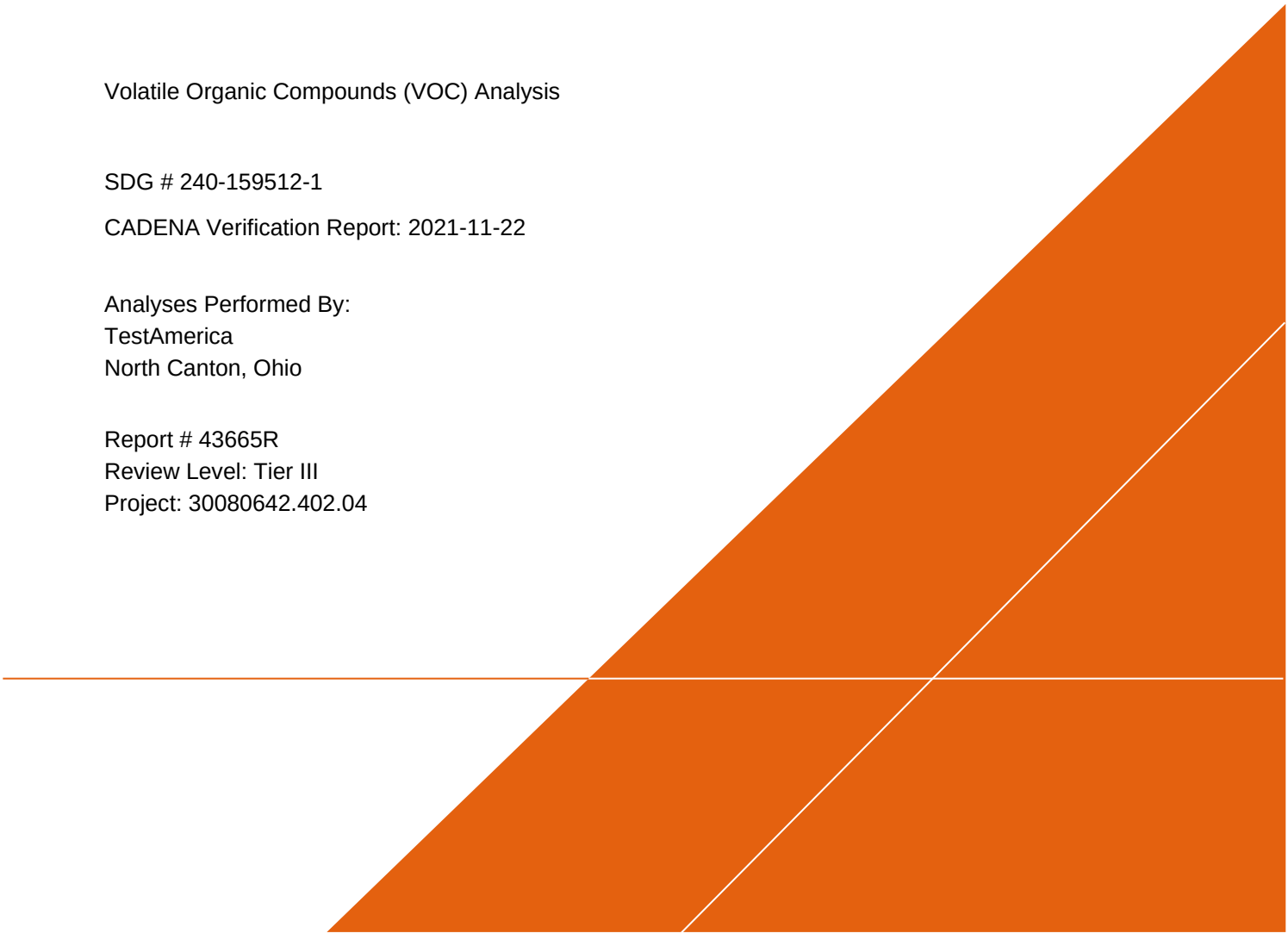
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159512-1

CADENA Verification Report: 2021-11-22

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43665R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159512-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_45	240-159512-1	Water	11/04/21		X	
MW-155S_110421	240-159512-2	Water	11/04/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial / Continuing	Compound	Criteria
TRIP BLANK_45 MW-155S_110421	Continuous Calibration Verification %D	Vinyl chloride	-21.2%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	

Initial/Continuing	Criteria	Sample Result	Qualification
Initial Calibration	%RSD > 20% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD > 90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D > 90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1]RRF of 0.01 only applies to compounds which are typically poor responding compounds

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 09, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 09, 2021

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM				Sample Specific Notes / Special Instructions:
TRIP BLANK_45	---	---		X						1					N	G	X	X	X	X	X	X	X (w)				1 Trip Blank
MW-155S_110421	11/04/21	1511		X						6					N	G	X	X	X	X	X	X	X				3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159512 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: Gary Schafer	Arcadis	11/04/21	1605	Received by: Novi cold storage	Arcadis	11/04/21	1608
Relinquished by: Heather Allen	ARCADIS	11/5/21	1435	Received by: Jeri Hare	ETA	11/5/21	1435
Relinquished by: Jeri Hare	ETA	11/5/21	1448	Received in Laboratory by: M. ★. ★	ETA	11/6/21	8:00

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11/22/2021

Client Sample ID: TRIP BLANK_45
Lab Sample ID: 240-159512-1
Date Collected: 11/04/21 00:00
Matrix: Water
Date Received: 11/06/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 15:02	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 15:02	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 15:02	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 15:02	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 15:02	1
Vinyl chloride	1.0	~~U~~ UJ	1.0	0.45	ug/L			11/13/21 15:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*121*		*62 - 137*		*11/13/21 15:02*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/13/21 15:02*	*1*
Toluene-d8 (Surr)	*87*		*78 - 122*		*11/13/21 15:02*	*1*
Dibromofluoromethane (Surr)	*108*		*73 - 120*		*11/13/21 15:02*	*1*

Client Sample ID: MW-155S_110421
Lab Sample ID: 240-159512-2
Date Collected: 11/04/21 15:11
Matrix: Water
Date Received: 11/06/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 01:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*66 - 120*		*11/12/21 01:02*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 15:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 15:24	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 15:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 15:24	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 15:24	1
Vinyl chloride	1.0	~~U~~ UJ	1.0	0.45	ug/L			11/13/21 15:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*126*		*62 - 137*		*11/13/21 15:24*	*1*
4-Bromofluorobenzene (Surr)	*70*		*56 - 136*		*11/13/21 15:24*	*1*
Toluene-d8 (Surr)	*87*		*78 - 122*		*11/13/21 15:24*	*1*
Dibromofluoromethane (Surr)	*109*		*73 - 120*		*11/13/21 15:24*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159620-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/22/2021 3:37:36 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159620-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159620-1

Job ID: 240-159620-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159620-1

Comments
No additional comments.

Receipt
The samples were received on 11/9/2021 10:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 3.7º C and 3.8º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159620-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159620-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159620-1	TRIP BLANK_30	Water	11/05/21 00:00	11/09/21 10:00
240-159620-2	MW-157S_110521	Water	11/05/21 13:55	11/09/21 10:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159620-1

Client Sample ID: TRIP BLANK_30 — Lab Sample ID: 240-159620-1

No Detections.

Client Sample ID: MW-157S_110521 — Lab Sample ID: 240-159620-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159620-1

Client Sample ID: TRIP BLANK_30

Date Collected: 11/05/21 00:00
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159620-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 16:28	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 16:28	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 16:28	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 16:28	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 16:28	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 16:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*11/16/21 16:28*	*1*
4-Bromofluorobenzene (Surr)	*86*		*56 - 136*		*11/16/21 16:28*	*1*
Toluene-d8 (Surr)	*96*		*78 - 122*		*11/16/21 16:28*	*1*
Dibromofluoromethane (Surr)	*107*		*73 - 120*		*11/16/21 16:28*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159620-1

Client Sample ID: MW-157S_110521
Date Collected: 11/05/21 13:55
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159620-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/16/21 22:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/16/21 22:35*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 20:01	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 20:01	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 20:01	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 20:01	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 20:01	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 20:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*62 - 137*		*11/16/21 20:01*	*1*
4-Bromofluorobenzene (Surr)	*92*		*56 - 136*		*11/16/21 20:01*	*1*
Toluene-d8 (Surr)	*100*		*78 - 122*		*11/16/21 20:01*	*1*
Dibromofluoromethane (Surr)	*115*		*73 - 120*		*11/16/21 20:01*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159620-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159620-1	TRIP BLANK_30	96	86	96	107
240-159620-2	MW-157S_110521	106	92	100	115
240-159636-F-2 MS	Matrix Spike	93	93	102	105
240-159636-G-2 MSD	Matrix Spike Duplicate	93	94	103	105
LCS 240-513208/5	Lab Control Sample	86	91	100	101
MB 240-513208/8	Method Blank	91	87	98	108

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159546-G-2 MS	Matrix Spike	82
240-159546-M-2 MSD	Matrix Spike Duplicate	85
240-159620-2	MW-157S_110521	84
LCS 240-513286/4	Lab Control Sample	82
MB 240-513286/5	Method Blank	85

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513208/8
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 14:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 14:06	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 14:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 14:06	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 14:06	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 14:06	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*62 - 137*		*11/16/21 14:06*	*1*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*		*11/16/21 14:06*	*1*
Toluene-d8 (Surr)	*98*		*78 - 122*		*11/16/21 14:06*	*1*
Dibromofluoromethane (Surr)	*108*		*73 - 120*		*11/16/21 14:06*	*1*

Lab Sample ID: LCS 240-513208/5
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	28.3		ug/L		113	63 - 134
cis-1,2-Dichloroethene	25.0	26.1		ug/L		104	77 - 123
Tetrachloroethene	25.0	29.3		ug/L		117	76 - 123
trans-1,2-Dichloroethene	25.0	27.4		ug/L		110	75 - 124
Trichloroethene	25.0	27.4		ug/L		110	70 - 122
Vinyl chloride	25.0	24.0		ug/L		96	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*
4-Bromofluorobenzene (Surr)	*91*		*56 - 136*
Toluene-d8 (Surr)	*100*		*78 - 122*
Dibromofluoromethane (Surr)	*101*		*73 - 120*

Lab Sample ID: 240-159636-F-2 MS
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	25.0	25.8		ug/L		103	56 - 135
cis-1,2-Dichloroethene	1.0	U	25.0	24.8		ug/L		99	66 - 128
Tetrachloroethene	1.0	U	25.0	28.9		ug/L		116	62 - 131
trans-1,2-Dichloroethene	1.0	U	25.0	25.3		ug/L		101	56 - 136
Trichloroethene	1.0	U	25.0	25.4		ug/L		101	61 - 124
Vinyl chloride	1.0	U	25.0	22.2		ug/L		89	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*93*		*56 - 136*
Toluene-d8 (Surr)	*102*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159636-F-2 MS
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*105*		*73 - 120*

Lab Sample ID: 240-159636-G-2 MSD
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	25.0	25.9		ug/L		104	56 - 135	0	26
cis-1,2-Dichloroethene	1.0	U	25.0	25.0		ug/L		100	66 - 128	1	14
Tetrachloroethene	1.0	U	25.0	29.5		ug/L		118	62 - 131	2	20
trans-1,2-Dichloroethene	1.0	U	25.0	25.1		ug/L		100	56 - 136	1	15
Trichloroethene	1.0	U	25.0	25.3		ug/L		101	61 - 124	0	15
Vinyl chloride	1.0	U	25.0	22.3		ug/L		89	43 - 157	1	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*
Toluene-d8 (Surr)	*103*		*78 - 122*
Dibromofluoromethane (Surr)	*105*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513286/5
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/16/21 19:44	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/16/21 19:44*	*1*

Lab Sample ID: LCS 240-513286/4
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	9.78		ug/L		98	80 - 122		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159546-G-2 MS
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U F1	10.0	11.0		ug/L		110	51 - 153		

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159546-M-2 MSD
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.83		ug/L		98	51 - 153	11	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159620-1

GC/MS VOA

Analysis Batch: 513208

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159620-1	TRIP BLANK_30	Total/NA	Water	8260B	
240-159620-2	MW-157S_110521	Total/NA	Water	8260B	
MB 240-513208/8	Method Blank	Total/NA	Water	8260B	
LCS 240-513208/5	Lab Control Sample	Total/NA	Water	8260B	
240-159636-F-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159636-G-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 513286

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159620-2	MW-157S_110521	Total/NA	Water	8260B SIM	
MB 240-513286/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513286/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159546-G-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159546-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159620-1

Client Sample ID: TRIP BLANK_30

Lab Sample ID: 240-159620-1

Date Collected: 11/05/21 00:00

Matrix: Water

Date Received: 11/09/21 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513208	11/16/21 16:28	SAM	TAL CAN

Client Sample ID: MW-157S_110521

Lab Sample ID: 240-159620-2

Date Collected: 11/05/21 13:55

Matrix: Water

Date Received: 11/09/21 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513208	11/16/21 20:01	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	513286	11/16/21 22:35	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159620-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

MICHIGAN 190

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: ANDREW BANITT	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day (10 day)		Walk-in client: Lab sampling:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30080642.402.04	Shipping/Tracking No:			
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_30	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1575_110521	11/5/21	1355		X						G					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159620 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalla@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company:	Date/Time:		Company:	Date/Time:
Relinquished by:	Arcadis	11/5/21 1500	Received by: Novi Cold Storage	Arcadis	11/5/21 1500
Relinquished by:	ARCADIS	11/8/21 / 1200	Received by:	ETA	11/8/21 1200
Relinquished by:	ETA	11/8/21	Received in Laboratory by:	ETA	11-9-21 1000

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 159620
Canton Facility

Client ARCADIS Site Name _____ Cooler unpacked by: Tammy Page

Cooler Received on 11-9-21 Opened on 11-9-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # _____ Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form

IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 2	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?	Yes	No
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No Yes 11/11/21
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC157842
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 60358	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

The TB is not logged for SIM ~~due to insufficient volume~~. per corrected COC. 11/11/21 ~~11/9/21~~

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

Login # : 159620

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form				
Cooler Description (Circle)	**IR Gun # (Circle)**	**Observed Temp °C**	**Corrected Temp °C**	**Coolant (Circle)**
(TA) Client Box Other	(IR-14) IR-15	3.6	3.7	(Wet Ice) Blue Ice Dry Ice Water None
(TA) Client Box Other	(IR-14) IR-15	3.7	3.8	(Wet Ice) Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice

DATA VERIFICATION REPORT

November 22, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159620-1
Sample date: 2021-11-05
Report received by CADENA: 2021-11-22
Initial Data Verification completed by CADENA: 2021-11-22
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159620-1

		Sample Name:	TRIP BLANK_30				MW-157S_110521			
		Lab Sample ID:	2401596201				2401596202			
		Sample Date:	11/5/2021				11/5/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

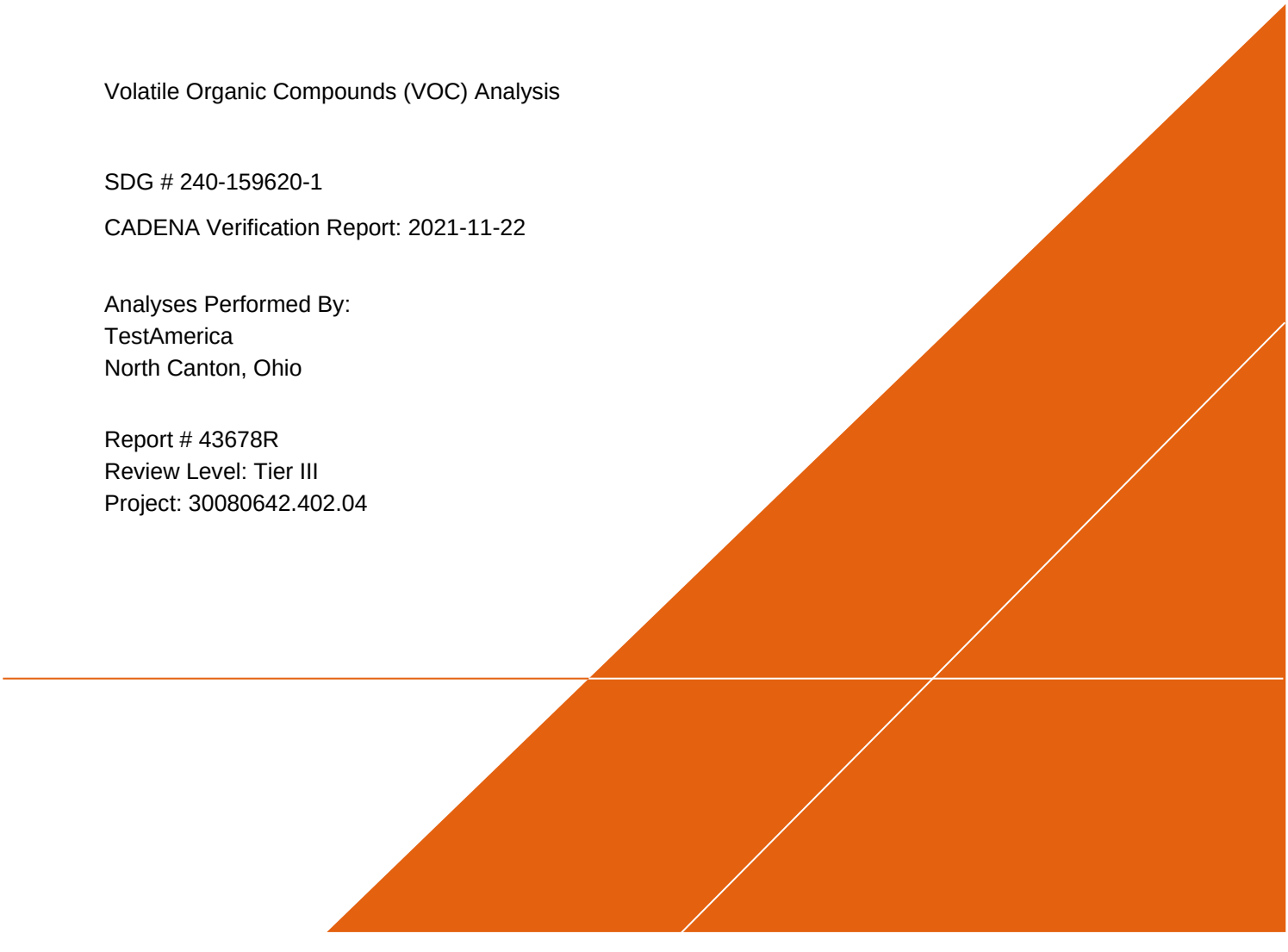
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159620-1

CADENA Verification Report: 2021-11-22

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43678R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159620-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_30	240-159620-1	Water	11/05/21		X	
MW-157S_110521	240-159620-2	Water	11/05/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: December 10, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 14, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190 — TestAmerica — THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: ANDREW BANITT	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day — 10 day		Walk-in client:
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30080642.402.04				
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_30	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1575_110521	11/5/21	1355		X						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM



Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalla@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Arcadis	11/5/21 1500	Novi Cold Storage	Arcadis	11/5/21 1500
	ARCADIS	11/8/21 / 1200		ETA	11/8/21 1200
	ETA	11/8/21		ETA	11-9-21 1000

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11/22/2021

Client Sample ID: TRIP BLANK_30
Lab Sample ID: 240-159620-1
Date Collected: 11/05/21 00:00
Matrix: Water
Date Received: 11/09/21 10:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 16:28	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 16:28	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 16:28	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 16:28	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 16:28	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 16:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*		*11/16/21 16:28*	*1*
4-Bromofluorobenzene (Surr)	*86*		*56 - 136*		*11/16/21 16:28*	*1*
Toluene-d8 (Surr)	*96*		*78 - 122*		*11/16/21 16:28*	*1*
Dibromofluoromethane (Surr)	*107*		*73 - 120*		*11/16/21 16:28*	*1*

Client Sample ID: MW-157S_110521
Lab Sample ID: 240-159620-2
Date Collected: 11/05/21 13:55
Matrix: Water
Date Received: 11/09/21 10:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/16/21 22:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/16/21 22:35*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 20:01	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 20:01	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 20:01	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 20:01	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 20:01	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 20:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*62 - 137*		*11/16/21 20:01*	*1*
4-Bromofluorobenzene (Surr)	*92*		*56 - 136*		*11/16/21 20:01*	*1*
Toluene-d8 (Surr)	*100*		*78 - 122*		*11/16/21 20:01*	*1*
Dibromofluoromethane (Surr)	*115*		*73 - 120*		*11/16/21 20:01*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-159624-1
Client Project/Site: Ford LTP - Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
11/23/2021 9:16:43 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159624-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159624-1

Job ID: 240-159624-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-159624-1

Comments
No additional comments.

Receipt
The samples were received on 11/9/2021 10:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 3.7° C and 3.8° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159624-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159624-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159624-1	TRIP BLANK_78	Water	11/05/21 00:00	11/09/21 10:00
240-159624-2	MW-143S_110521	Water	11/05/21 11:30	11/09/21 10:00

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159624-1

Client Sample ID: TRIP BLANK_78 — Lab Sample ID: 240-159624-1

No Detections.

Client Sample ID: MW-143S_110521 — Lab Sample ID: 240-159624-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159624-1

Client Sample ID: TRIP BLANK_78
Date Collected: 11/05/21 00:00
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159624-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 17:15	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 17:15	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 17:15	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 17:15	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 17:15	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 17:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/16/21 17:15*	*1*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*		*11/16/21 17:15*	*1*
Toluene-d8 (Surr)	*93*		*78 - 122*		*11/16/21 17:15*	*1*
Dibromofluoromethane (Surr)	*104*		*73 - 120*		*11/16/21 17:15*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159624-1

Client Sample ID: MW-143S_110521

Lab Sample ID: 240-159624-2

Date Collected: 11/05/21 11:30

Matrix: Water

Date Received: 11/09/21 10:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/16/21 23:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/16/21 23:23*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 20:48	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 20:48	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 20:48	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 20:48	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 20:48	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 20:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*62 - 137*		*11/16/21 20:48*	*1*
4-Bromofluorobenzene (Surr)	*88*		*56 - 136*		*11/16/21 20:48*	*1*
Toluene-d8 (Surr)	*99*		*78 - 122*		*11/16/21 20:48*	*1*
Dibromofluoromethane (Surr)	*115*		*73 - 120*		*11/16/21 20:48*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159624-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159624-1	TRIP BLANK_78	93	84	93	104
240-159624-2	MW-143S_110521	104	88	99	115
240-159636-F-2 MS	Matrix Spike	93	93	102	105
240-159636-G-2 MSD	Matrix Spike Duplicate	93	94	103	105
LCS 240-513208/5	Lab Control Sample	86	91	100	101
MB 240-513208/8	Method Blank	91	87	98	108

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(66-120)
240-159546-G-2 MS	Matrix Spike	82
240-159546-M-2 MSD	Matrix Spike Duplicate	85
240-159624-2	MW-143S_110521	84
LCS 240-513286/4	Lab Control Sample	82
MB 240-513286/5	Method Blank	85

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513208/8
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 14:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 14:06	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 14:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 14:06	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 14:06	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 14:06	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*62 - 137*		*11/16/21 14:06*	*1*
4-Bromofluorobenzene (Surr)	*87*		*56 - 136*		*11/16/21 14:06*	*1*
Toluene-d8 (Surr)	*98*		*78 - 122*		*11/16/21 14:06*	*1*
Dibromofluoromethane (Surr)	*108*		*73 - 120*		*11/16/21 14:06*	*1*

Lab Sample ID: LCS 240-513208/5
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	28.3		ug/L		113	63 - 134
cis-1,2-Dichloroethene	25.0	26.1		ug/L		104	77 - 123
Tetrachloroethene	25.0	29.3		ug/L		117	76 - 123
trans-1,2-Dichloroethene	25.0	27.4		ug/L		110	75 - 124
Trichloroethene	25.0	27.4		ug/L		110	70 - 122
Vinyl chloride	25.0	24.0		ug/L		96	60 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*62 - 137*
4-Bromofluorobenzene (Surr)	*91*		*56 - 136*
Toluene-d8 (Surr)	*100*		*78 - 122*
Dibromofluoromethane (Surr)	*101*		*73 - 120*

Lab Sample ID: 240-159636-F-2 MS
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	25.0	25.8		ug/L		103	56 - 135
cis-1,2-Dichloroethene	1.0	U	25.0	24.8		ug/L		99	66 - 128
Tetrachloroethene	1.0	U	25.0	28.9		ug/L		116	62 - 131
trans-1,2-Dichloroethene	1.0	U	25.0	25.3		ug/L		101	56 - 136
Trichloroethene	1.0	U	25.0	25.4		ug/L		101	61 - 124
Vinyl chloride	1.0	U	25.0	22.2		ug/L		89	43 - 157

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*93*		*56 - 136*
Toluene-d8 (Surr)	*102*		*78 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-159636-F-2 MS
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*105*		*73 - 120*

Lab Sample ID: 240-159636-G-2 MSD
Matrix: Water
Analysis Batch: 513208

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	25.0	25.9		ug/L		104	56 - 135	0	26
cis-1,2-Dichloroethene	1.0	U	25.0	25.0		ug/L		100	66 - 128	1	14
Tetrachloroethene	1.0	U	25.0	29.5		ug/L		118	62 - 131	2	20
trans-1,2-Dichloroethene	1.0	U	25.0	25.1		ug/L		100	56 - 136	1	15
Trichloroethene	1.0	U	25.0	25.3		ug/L		101	61 - 124	0	15
Vinyl chloride	1.0	U	25.0	22.3		ug/L		89	43 - 157	1	24

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*
4-Bromofluorobenzene (Surr)	*94*		*56 - 136*
Toluene-d8 (Surr)	*103*		*78 - 122*
Dibromofluoromethane (Surr)	*105*		*73 - 120*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-513286/5
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/16/21 19:44	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*		*11/16/21 19:44*	*1*

Lab Sample ID: LCS 240-513286/4
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.78		ug/L		98	80 - 122

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159546-G-2 MS
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U F1	10.0	11.0		ug/L		110	51 - 153

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*66 - 120*

Lab Sample ID: 240-159546-M-2 MSD
Matrix: Water
Analysis Batch: 513286

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U F1	10.0	9.83		ug/L		98	51 - 153	11	16

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*85*		*66 - 120*

GC/MS VOA

Analysis Batch: 513208

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159624-1	TRIP BLANK_78	Total/NA	Water	8260B	
240-159624-2	MW-143S_110521	Total/NA	Water	8260B	
MB 240-513208/8	Method Blank	Total/NA	Water	8260B	
LCS 240-513208/5	Lab Control Sample	Total/NA	Water	8260B	
240-159636-F-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159636-G-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 513286

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159624-2	MW-143S_110521	Total/NA	Water	8260B SIM	
MB 240-513286/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513286/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159546-G-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159546-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159624-1

Client Sample ID: TRIP BLANK_78

Lab Sample ID: 240-159624-1

Date Collected: 11/05/21 00:00

Matrix: Water

Date Received: 11/09/21 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513208	11/16/21 17:15	SAM	TAL CAN

Client Sample ID: MW-143S_110521

Lab Sample ID: 240-159624-2

Date Collected: 11/05/21 11:30

Matrix: Water

Date Received: 11/09/21 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513208	11/16/21 20:48	SAM	TAL CAN
Total/NA	Analysis	8260B SIM		1	513286	11/16/21 23:23	CS	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159624-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-22
Georgia	State	4062	02-23-22
Illinois	NELAP	200004	07-31-22
Iowa	State	421	06-01-23
Kansas	NELAP	E-10336	04-30-22
Kentucky (UST)	State	112225	02-23-22
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-23
New Jersey	NELAP	OH001	06-30-22
New York	NELAP	10975	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-22
Texas	NELAP	T104704517-18-10	08-31-22
Virginia	NELAP	11570	09-14-22
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

MICHIGAN 190 TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Samantha Hinckle	TAT if different from below		Walk-in client
Phone: 248-994-2240	COURIER: CHRISTINA WEAVER	10 day ✓ 3 weeks 2 weeks 1 week 2 days 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30080642.402.04	Shipping/Tracking No:			
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_78	—	—		X						1							X	X	X	X	X	X	X	1 Trip Blank
MW-143S_110521	11/5/21	11:30		6						6							X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159624 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client ✓ Disposal By Lab Archive For Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Arcadis	11/5/21 16:30	NOVI COLD STORAGE	ARCADIS	11/5/21 / 16:30
Relinquished by:	ARCADIS	11/8/21 / 1200		ETA	11/8/21 / 1200
Relinquished by:	ETA	11/9/21	Received in Laboratory by:	ETA	11-9-21 1000

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11/23/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 159624
Canton Facility

Client ARCADIS Site Name _____ Cooler unpacked by: Tammy Dayer

Cooler Received on 11-9-21 Opened on 11-9-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form
   IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   IR GUN #IR-15 (CF +0.2°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 2 Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
   -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? Yes No
11. Sufficient quantity received to perform indicated analyses? Yes No Yes JMC 11/11/21
12. Are these work share samples and all listed on the COC? Yes No
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# **HC157842**
14. Were VOAs on the COC? Yes No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 60358 Yes No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page Samples processed by:

The TB is not logged for SIM ~~due to insufficient volume.~~ per corrected COC. JMC 11/11/21 ~~JMC 11-9-21~~

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

WI-NC-099

Login # : _____

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form				
Cooler Description (Circle)	**IR Gun # (Circle)**	**Observed Temp °C**	**Corrected Temp °C**	**Coolant (Circle)**
(TA) Client Box Other	(IR-14) IR-15	3.6	3.7	(Wet Ice) Blue Ice Dry Ice Water None
(TA) Client Box Other	(IR-14) IR-15	3.7	3.8	(Wet Ice) Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-14 IR-15			Wet Ice Blue Ice Dry Ice Water None
☐ See Temperature Excursion Form				

WI-NC-099 Cooler Receipt Form Page 2 - Multiple Coolers

DATA VERIFICATION REPORT

November 23, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30080642.402.04 OFF-SITE GW
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 159624-1
Sample date: 2021-11-05
Report received by CADENA: 2021-11-23
Initial Data Verification completed by CADENA: 2021-11-23
Number of Samples:2
Sample Matrices: Water
Test Categories: GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 159624-1

		Sample Name:	TRIP BLANK_78				MW-143S_110521			
		Lab Sample ID:	2401596241				2401596242			
		Sample Date:	11/5/2021				11/5/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

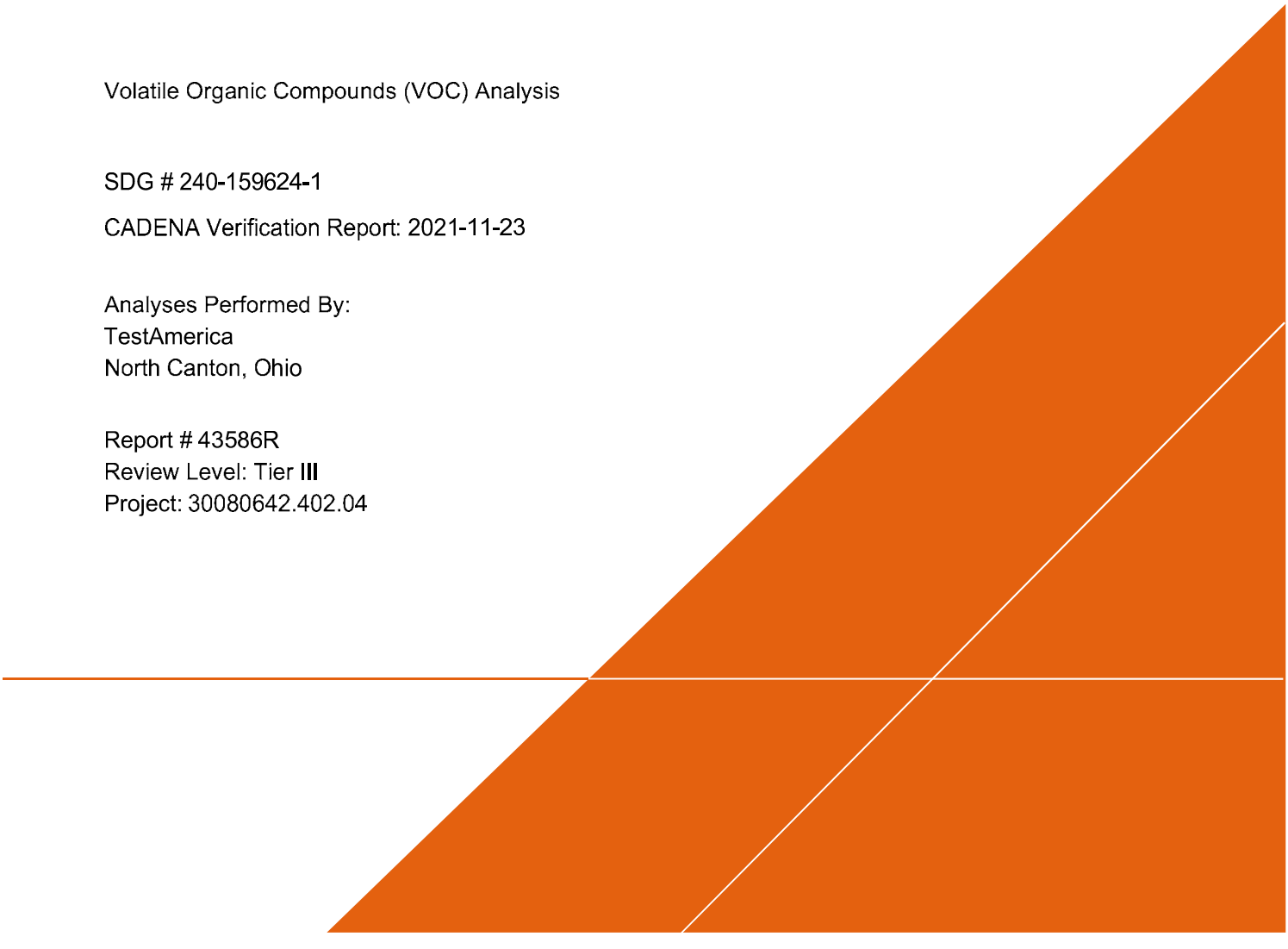
Volatile Organic Compounds (VOC) Analysis

SDG # 240-159624-1

CADENA Verification Report: 2021-11-23

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 43586R
Review Level: Tier III
Project: 30080642.402.04



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159624-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) include a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK_78	240-159624-1	Water	11/05/21		X	
MW-143S_110521	240-159624-2	Water	11/05/21		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Bhagyashree Fulzele

SIGNATURE: 

DATE: December 14, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 14, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190 TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Samantha Hinckle	TAT if different from below		Walk-in client
Phone: 248-994-2240	COURIER: CHRISTINA WEAVER	10 day ✓ 3 weeks 2 weeks 1 week 2 days 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30080642.402.04	Shipping/Tracking No:			
PO # 30080642.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK_78	—	—		X						1							X	X	X	X	X	X	X	1 Trip Blank
MW-143S_110521	11/5/21	11:30		6						6							X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-159624 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client ✓ Disposal By Lab Archive For Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Arcadis	11/5/21 16:30	NOVI COLD STORAGE	ARCADIS	11/5/21 / 16:30
Relinquished by:	ARCADIS	11/8/21 / 1200		ETA	11/8/21 / 1200
Relinquished by:	ETA	11/9/21	Received in Laboratory by:	ETA	11-9-21 1000

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11/23/2021

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159624-1

Client Sample ID: TRIP BLANK_78
Date Collected: 11/05/21 00:00
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159624-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 17:15	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 17:15	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 17:15	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 17:15	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 17:15	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 17:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*		*11/16/21 17:15*	*1*
4-Bromofluorobenzene (Surr)	*84*		*56 - 136*		*11/16/21 17:15*	*1*
Toluene-d8 (Surr)	*93*		*78 - 122*		*11/16/21 17:15*	*1*
Dibromofluoromethane (Surr)	*104*		*73 - 120*		*11/16/21 17:15*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off-Site

Job ID: 240-159624-1

Client Sample ID: MW-143S_110521

Date Collected: 11/05/21 11:30
Date Received: 11/09/21 10:00

Lab Sample ID: 240-159624-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/16/21 23:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*66 - 120*		*11/16/21 23:23*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/16/21 20:48	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/16/21 20:48	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 20:48	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/16/21 20:48	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/16/21 20:48	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/16/21 20:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*62 - 137*		*11/16/21 20:48*	*1*
4-Bromofluorobenzene (Surr)	*88*		*56 - 136*		*11/16/21 20:48*	*1*
Toluene-d8 (Surr)	*99*		*78 - 122*		*11/16/21 20:48*	*1*
Dibromofluoromethane (Surr)	*115*		*73 - 120*		*11/16/21 20:48*	*1*

Appendix D

(Continued)

Groundwater and Soil Analytical Reports
(includes Golder Associates Historical Reports)

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144368-1
Client Project/Site: Ford LTP - Off Site
Revision: 1

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/26/2021 9:33:30 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at:
www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144368-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144368-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144368-1

Comments
No additional comments.

Revision
The report being provided is a revision of the original report sent on 2/19/2021. The report (revision 1) is being revised due to: Samples mislabeled during unpacking - revised to correct data.

Receipt
The samples were received on 2/11/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.2° C.

GC/MS VOA
Method 8260B: The following sample was analyzed outside of analytical holding time due to mis-labeled vial: TRIP BLANK (240-144368-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144368-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144368-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144368-1	TRIP BLANK	Water	02/09/21 00:00	02/11/21 08:00	
240-144368-2	MW-94S_020921	Water	02/09/21 11:46	02/11/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144368-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144368-1

No Detections.

Client Sample ID: MW-94S_020921 — Lab Sample ID: 240-144368-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144368-1

Client Sample ID: TRIP BLANK
Date Collected: 02/09/21 00:00
Date Received: 02/11/21 08:00

Lab Sample ID: 240-144368-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U H	1.0	0.19	ug/L			03/15/21 19:00	1
cis-1,2-Dichloroethene	1.0	U H	1.0	0.16	ug/L			03/15/21 19:00	1
Tetrachloroethene	1.0	U H	1.0	0.15	ug/L			03/15/21 19:00	1
trans-1,2-Dichloroethene	1.0	U H	1.0	0.19	ug/L			03/15/21 19:00	1
Trichloroethene	1.0	U H	1.0	0.10	ug/L			03/15/21 19:00	1
Vinyl chloride	1.0	U H	1.0	0.20	ug/L			03/15/21 19:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*75 - 130*		*03/15/21 19:00*	*1*
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*		*03/15/21 19:00*	*1*
Toluene-d8 (Surr)	*98*		*69 - 122*		*03/15/21 19:00*	*1*
Dibromofluoromethane (Surr)	*84*		*78 - 129*		*03/15/21 19:00*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144368-1

Client Sample ID: MW-94S_020921

Date Collected: 02/09/21 11:46
Date Received: 02/11/21 08:00

Lab Sample ID: 240-144368-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 19:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/12/21 19:38*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 13:48	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 13:48	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 13:48	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 13:48	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 13:48	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 13:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*75 - 130*		*02/15/21 13:48*	*1*
4-Bromofluorobenzene (Surr)	*71*		*47 - 134*		*02/15/21 13:48*	*1*
Toluene-d8 (Surr)	*81*		*69 - 122*		*02/15/21 13:48*	*1*
Dibromofluoromethane (Surr)	*112*		*78 - 129*		*02/15/21 13:48*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144368-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
190-25454-E-1 MS	Matrix Spike	79	97	95	83
190-25454-F-1 MSD	Matrix Spike Duplicate	84	95	95	86
240-144368-1	TRIP BLANK	82	96	98	84
240-144368-2	MW-94S_020921	116	71	81	112
240-144376-H-3 MS	Matrix Spike	93	95	93	95
240-144376-I-3 MSD	Matrix Spike Duplicate	86	86	85	91
LCS 240-473065/4	Lab Control Sample	89	93	91	93
LCS 240-476776/4	Lab Control Sample	78	94	97	83
MB 240-473065/7	Method Blank	103	70	83	105
MB 240-476776/7	Method Blank	80	91	98	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144368-2	MW-94S_020921	83
240-144376-F-3 MS	Matrix Spike	83
240-144376-F-3 MSD	Matrix Spike Duplicate	82
LCS 240-472900/4	Lab Control Sample	82
MB 240-472900/5	Method Blank	82

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473065/7
Matrix: Water
Analysis Batch: 473065

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 11:48	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 11:48	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 11:48	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 11:48	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 11:48	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 11:48	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*75 - 130*		*02/15/21 11:48*	*1*
4-Bromofluorobenzene (Surr)	*70*		*47 - 134*		*02/15/21 11:48*	*1*
Toluene-d8 (Surr)	*83*		*69 - 122*		*02/15/21 11:48*	*1*
Dibromofluoromethane (Surr)	*105*		*78 - 129*		*02/15/21 11:48*	*1*

Lab Sample ID: LCS 240-473065/4
Matrix: Water
Analysis Batch: 473065

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.81		ug/L		98	73 - 129
cis-1,2-Dichloroethene	10.0	9.60		ug/L		96	75 - 124
Tetrachloroethene	10.0	11.2		ug/L		112	70 - 125
trans-1,2-Dichloroethene	10.0	10.3		ug/L		103	74 - 130
Trichloroethene	10.0	10.1		ug/L		101	71 - 121
Vinyl chloride	10.0	8.27		ug/L		83	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*75 - 130*
4-Bromofluorobenzene (Surr)	*93*		*47 - 134*
Toluene-d8 (Surr)	*91*		*69 - 122*
Dibromofluoromethane (Surr)	*93*		*78 - 129*

Lab Sample ID: 240-144376-H-3 MS
Matrix: Water
Analysis Batch: 473065

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.84		ug/L		98	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	9.69		ug/L		97	68 - 121
Tetrachloroethene	1.0	U	10.0	10.8		ug/L		108	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.85		ug/L		98	69 - 126
Trichloroethene	1.0	U	10.0	9.18		ug/L		92	56 - 124
Vinyl chloride	1.0	U	10.0	8.01		ug/L		80	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144376-H-3 MS
Matrix: Water
Analysis Batch: 473065

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*95*		*78 - 129*

Lab Sample ID: 240-144376-I-3 MSD
Matrix: Water
Analysis Batch: 473065

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.36		ug/L		94	64 - 132	5	35
cis-1,2-Dichloroethene	1.0	U	10.0	9.44		ug/L		94	68 - 121	3	35
Tetrachloroethene	1.0	U	10.0	9.39		ug/L		94	52 - 129	14	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.90		ug/L		99	69 - 126	1	35
Trichloroethene	1.0	U	10.0	9.24		ug/L		92	56 - 124	1	35
Vinyl chloride	1.0	U	10.0	8.23		ug/L		82	49 - 136	3	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*
4-Bromofluorobenzene (Surr)	*86*		*47 - 134*
Toluene-d8 (Surr)	*85*		*69 - 122*
Dibromofluoromethane (Surr)	*91*		*78 - 129*

Lab Sample ID: MB 240-476776/7
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/15/21 15:40	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/15/21 15:40	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/15/21 15:40	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/15/21 15:40	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/15/21 15:40	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/15/21 15:40	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*75 - 130*		*03/15/21 15:40*	*1*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*		*03/15/21 15:40*	*1*
Toluene-d8 (Surr)	*98*		*69 - 122*		*03/15/21 15:40*	*1*
Dibromofluoromethane (Surr)	*81*		*78 - 129*		*03/15/21 15:40*	*1*

Lab Sample ID: LCS 240-476776/4
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.48		ug/L		85	73 - 129
cis-1,2-Dichloroethene	10.0	9.17		ug/L		92	75 - 124
Tetrachloroethene	10.0	10.2		ug/L		102	70 - 125
trans-1,2-Dichloroethene	10.0	8.93		ug/L		89	74 - 130
Trichloroethene	10.0	8.97		ug/L		90	71 - 121

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-476776/4
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Vinyl chloride			10.0	11.1		ug/L		111	61 - 134		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*78*		*75 - 130*
4-Bromofluorobenzene (Surr)	*94*		*47 - 134*
Toluene-d8 (Surr)	*97*		*69 - 122*
Dibromofluoromethane (Surr)	*83*		*78 - 129*

Lab Sample ID: 190-25454-E-1 MS
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,1-Dichloroethene	1.0	U	10.0	6.81		ug/L		68	64 - 132		
cis-1,2-Dichloroethene	1.0	U	10.0	7.96		ug/L		80	68 - 121		
Tetrachloroethene	1.0	U	10.0	8.88		ug/L		89	52 - 129		
trans-1,2-Dichloroethene	1.0	U	10.0	7.48		ug/L		75	69 - 126		
Trichloroethene	1.0	U	10.0	7.78		ug/L		78	56 - 124		
Vinyl chloride	1.0	U	10.0	9.92		ug/L		99	49 - 136		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*75 - 130*
4-Bromofluorobenzene (Surr)	*97*		*47 - 134*
Toluene-d8 (Surr)	*95*		*69 - 122*
Dibromofluoromethane (Surr)	*83*		*78 - 129*

Lab Sample ID: 190-25454-F-1 MSD
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	6.82		ug/L		68	64 - 132	0	35
cis-1,2-Dichloroethene	1.0	U	10.0	8.09		ug/L		81	68 - 121	2	35
Tetrachloroethene	1.0	U	10.0	8.78		ug/L		88	52 - 129	1	35
trans-1,2-Dichloroethene	1.0	U	10.0	7.87		ug/L		79	69 - 126	5	35
Trichloroethene	1.0	U	10.0	8.10		ug/L		81	56 - 124	4	35
Vinyl chloride	1.0	U	10.0	10.4		ug/L		104	49 - 136	4	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*95*		*69 - 122*
Dibromofluoromethane (Surr)	*86*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-472900/5
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 12:29	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/12/21 12:29*	*1*

Lab Sample ID: LCS 240-472900/4
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.6		ug/L		106	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144376-F-3 MS
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	10.8		ug/L		108	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*

Lab Sample ID: 240-144376-F-3 MSD
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.8		ug/L		108	46 - 170	1	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144368-1

GC/MS VOA

Analysis Batch: 472900

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144368-2	MW-94S_020921	Total/NA	Water	8260B SIM	
MB 240-472900/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-472900/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144376-F-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144376-F-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 473065

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144368-2	MW-94S_020921	Total/NA	Water	8260B	
MB 240-473065/7	Method Blank	Total/NA	Water	8260B	
LCS 240-473065/4	Lab Control Sample	Total/NA	Water	8260B	
240-144376-H-3 MS	Matrix Spike	Total/NA	Water	8260B	
240-144376-I-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 476776

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144368-1	TRIP BLANK	Total/NA	Water	8260B	
MB 240-476776/7	Method Blank	Total/NA	Water	8260B	
LCS 240-476776/4	Lab Control Sample	Total/NA	Water	8260B	
190-25454-E-1 MS	Matrix Spike	Total/NA	Water	8260B	
190-25454-F-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144368-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144368-1

Date Collected: 02/09/21 00:00

Matrix: Water

Date Received: 02/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	476776	03/15/21 19:00	LRW	TAL CAN

Client Sample ID: MW-94S_020921

Lab Sample ID: 240-144368-2

Date Collected: 02/09/21 11:46

Matrix: Water

Date Received: 02/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473065	02/15/21 13:48	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	472900	02/12/21 19:38	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144368-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

MICHIGAN 190 TestAmerica — THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day (10 day)		Walk-in client:
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/09/21			X						1					N	G	X	X	X	X	X	X	X	1 trip blank
MW-94S-020921	02/09/21	11:46		X						6					N	G	X	X	X	X	X	X	X	[redacted] 3 vials for 8260B, 3 vials for 8260B SIM

240-144368 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	02/09/21 1800	Novi cold storage	Arcadis	02/09/21 1801
Julia McClafferty	Arcadis	2/10/2021	Amanda Battistelli	ETA	2/10/21 10:12
Amanda Battistelli	ETA	2/10/21 1309	Received in Laboratory by:	ETA	2-11-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 144308**
Canton Facility

Client Arcadis Site Name

Cooler Received on 2-11-21 Opened on 2-11-21

Cooler unpacked by: MattSnyder

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # VA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2.1 °C Corrected Cooler Temp. 2.2 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC907861
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ____	Yes	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

March 26, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144368-1
Sample date: 2021-02-09
Report received by CADENA: 2021-03-26
Initial Data Verification completed by CADENA: 2021-03-26
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

HTQ - GCMS VOC sample TRIP BLANK analysis was performed outside of reference holding time due to an initial sample mix-up so all associated results should be considered to be estimated and qualified with UJ flags if non-detect.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Qualified Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144368-1

Sample Name: TRIP BLANK
Lab Sample ID: 2401443681
Sample Date: 2/9/2021

Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC					
OSW-8260B					
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	UJ
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	UJ
Tetrachloroethene	127-18-4	ND	1.0	ug/l	UJ
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	UJ
Trichloroethene	79-01-6	ND	1.0	ug/l	UJ
Vinyl chloride	75-01-4	ND	1.0	ug/l	UJ

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144368-1

		Sample Name:	TRIP BLANK				MW-94S_020921			
		Lab Sample ID:	2401443681				2401443682			
		Sample Date:	2/9/2021				2/9/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS Design & Consultancy for natural and built assets

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

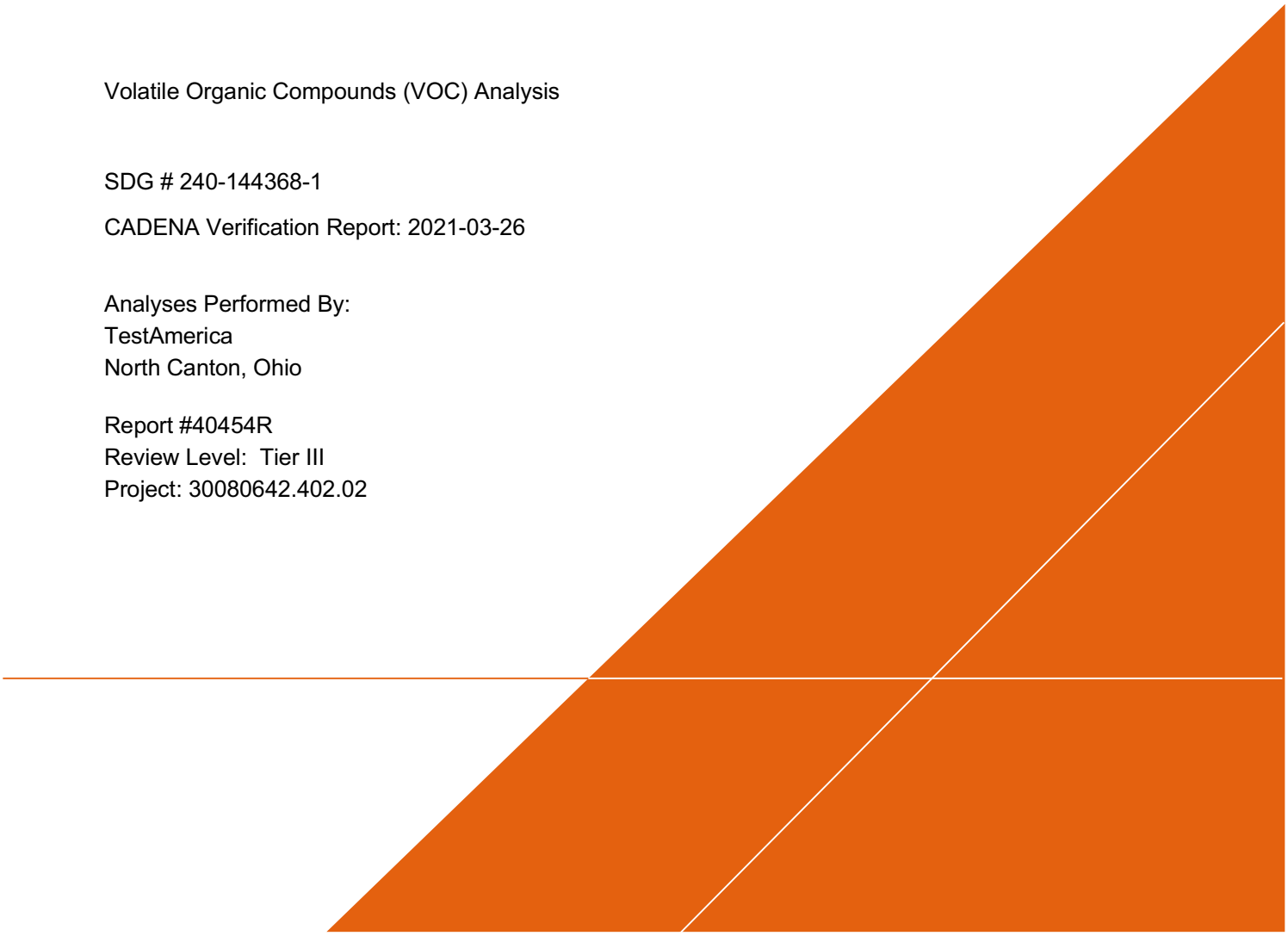
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144368-1

CADENA Verification Report: 2021-03-26

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report #40454R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144368-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					VOC
TRIP BLANK	240-144368-1	Water	02/09/2021		X
MW-94S_020921	240-144368-2	Water	02/09/2021		X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

The analyses that exceeded the holding are presented in the following table.

Sample ID	Holding Time	Criteria
TRIP BLANK	34 days	14 days from collection to analysis

Sample results associated with samples mentioned in the table above, analyzed by analytical method SW-846 8260B were qualified, as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

DATA REVIEW

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X	X		
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

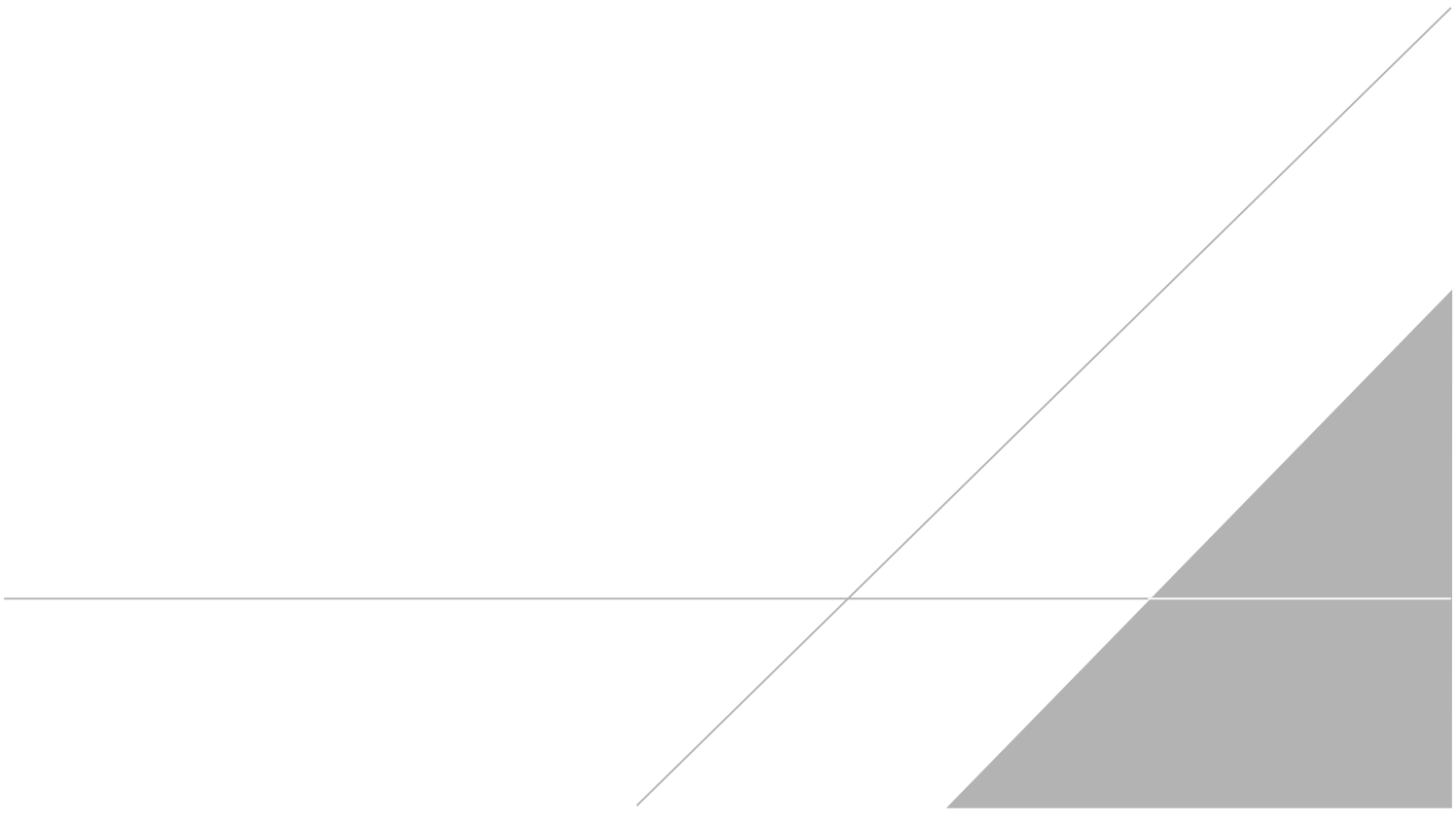
DATE: March 30, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 30, 2021

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



Chain of Custody Record

MICHIGAN 190 TestAmerica — THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client:
Phone: 248-994-2240	Method of Shipment/Carrier:	10 day		Lab sampling:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac / NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/09/21			X						1					N	G	X	X	X	X	X	X	X	1 trip blank
MW-945-020921	02/09/21	11:46		X						6					N	G	X	X	X	X	X	X	X	[redacted] 3 vials for 8260B, 3 vials for 8260B SIM

240-144368 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalla@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	02/09/21 1800	Novi cold storage	Arcadis	02/09/21 1801
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[illegible]	Arcadis	2/10/2021	[illegible]	ETA	2/10/21 10:12
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
[illegible]	ETA	2/10/21 1309	[illegible]	ETA	2-11-21 800

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144368-1

Date Collected: 02/09/21 00:00
Matrix: Water
Date Received: 02/11/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
~~1,1-Dichloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.19~~	~~ug/L~~			~~03/15/21 19:00~~		R 1
~~cis-1,2-Dichloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.16~~	~~ug/L~~			~~03/15/21 19:00~~		R 1
~~Tetrachloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.15~~	~~ug/L~~			~~03/15/21 19:00~~		R 1
~~trans-1,2-Dichloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.19~~	~~ug/L~~			~~03/15/21 19:00~~		R 1
~~Trichloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.10~~	~~ug/L~~			~~03/15/21 19:00~~		R 1
~~Vinyl chloride~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.20~~	~~ug/L~~			~~03/15/21 19:00~~		R 1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*75 - 130*		*03/15/21 19:00*	*1*
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*		*03/15/21 19:00*	*1*
Toluene-d8 (Surr)	*98*		*69 - 122*		*03/15/21 19:00*	*1*
Dibromofluoromethane (Surr)	*84*		*78 - 129*		*03/15/21 19:00*	*1*

Client Sample ID: MW-94S_020921
Lab Sample ID: 240-144368-2

Date Collected: 02/09/21 11:46
Matrix: Water
Date Received: 02/11/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 19:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/12/21 19:38*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 13:48	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 13:48	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 13:48	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 13:48	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 13:48	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 13:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*75 - 130*		*02/15/21 13:48*	*1*
4-Bromofluorobenzene (Surr)	*71*		*47 - 134*		*02/15/21 13:48*	*1*
Toluene-d8 (Surr)	*81*		*69 - 122*		*02/15/21 13:48*	*1*
Dibromofluoromethane (Surr)	*112*		*78 - 129*		*02/15/21 13:48*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144367-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
2/19/2021 11:38:48 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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Have a Question? Ask The Expert

Visit us at:
www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144367-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144367-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144367-1

Comments
No additional comments.

Receipt
The samples were received on 2/11/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.2° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144367-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144367-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144367-1	TRIP BLANK	Water	02/09/21 00:00	02/11/21 08:00	
240-144367-2	MW-172S_020921	Water	02/09/21 13:56	02/11/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144367-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144367-1

No Detections.

Client Sample ID: MW-172S_020921 — Lab Sample ID: 240-144367-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144367-1

Client Sample ID: TRIP BLANK
Date Collected: 02/09/21 00:00
Date Received: 02/11/21 08:00

Lab Sample ID: 240-144367-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 16:35	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 16:35	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 16:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 16:35	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 16:35	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 16:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*02/15/21 16:35*	*1*
4-Bromofluorobenzene (Surr)	*64*		*47 - 134*		*02/15/21 16:35*	*1*
Toluene-d8 (Surr)	*77*		*69 - 122*		*02/15/21 16:35*	*1*
Dibromofluoromethane (Surr)	*112*		*78 - 129*		*02/15/21 16:35*	*1*

Client Sample ID: MW-172S_020921

Date Collected: 02/09/21 13:56
Date Received: 02/11/21 08:00

Lab Sample ID: 240-144367-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 19:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/12/21 19:13*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 13:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 13:24	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 13:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 13:24	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 13:24	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 13:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*107*		*75 - 130*		*02/15/21 13:24*	*1*
4-Bromofluorobenzene (Surr)	*68*		*47 - 134*		*02/15/21 13:24*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*02/15/21 13:24*	*1*
Dibromofluoromethane (Surr)	*111*		*78 - 129*		*02/15/21 13:24*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144367-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144367-1	TRIP BLANK	104	64	77	112
240-144367-2	MW-172S_020921	107	68	80	111
240-144376-H-3 MS	Matrix Spike	93	95	93	95
240-144376-I-3 MSD	Matrix Spike Duplicate	86	86	85	91
LCS 240-473065/4	Lab Control Sample	89	93	91	93
MB 240-473065/7	Method Blank	103	70	83	105

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144367-2	MW-172S_020921	83
240-144376-F-3 MS	Matrix Spike	83
240-144376-F-3 MSD	Matrix Spike Duplicate	82
LCS 240-472900/4	Lab Control Sample	82
MB 240-472900/5	Method Blank	82

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473065/7
Matrix: Water
Analysis Batch: 473065

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 11:48	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 11:48	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 11:48	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 11:48	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 11:48	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 11:48	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*75 - 130*		*02/15/21 11:48*	*1*
4-Bromofluorobenzene (Surr)	*70*		*47 - 134*		*02/15/21 11:48*	*1*
Toluene-d8 (Surr)	*83*		*69 - 122*		*02/15/21 11:48*	*1*
Dibromofluoromethane (Surr)	*105*		*78 - 129*		*02/15/21 11:48*	*1*

Lab Sample ID: LCS 240-473065/4
Matrix: Water
Analysis Batch: 473065

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.81		ug/L		98	73 - 129
cis-1,2-Dichloroethene	10.0	9.60		ug/L		96	75 - 124
Tetrachloroethene	10.0	11.2		ug/L		112	70 - 125
trans-1,2-Dichloroethene	10.0	10.3		ug/L		103	74 - 130
Trichloroethene	10.0	10.1		ug/L		101	71 - 121
Vinyl chloride	10.0	8.27		ug/L		83	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*75 - 130*
4-Bromofluorobenzene (Surr)	*93*		*47 - 134*
Toluene-d8 (Surr)	*91*		*69 - 122*
Dibromofluoromethane (Surr)	*93*		*78 - 129*

Lab Sample ID: 240-144376-H-3 MS
Matrix: Water
Analysis Batch: 473065

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.84		ug/L		98	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	9.69		ug/L		97	68 - 121
Tetrachloroethene	1.0	U	10.0	10.8		ug/L		108	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.85		ug/L		98	69 - 126
Trichloroethene	1.0	U	10.0	9.18		ug/L		92	56 - 124
Vinyl chloride	1.0	U	10.0	8.01		ug/L		80	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144376-H-3 MS
Matrix: Water
Analysis Batch: 473065

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	95		78 - 129

Lab Sample ID: 240-144376-I-3 MSD
Matrix: Water
Analysis Batch: 473065

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.36		ug/L		94	64 - 132	5	35
cis-1,2-Dichloroethene	1.0	U	10.0	9.44		ug/L		94	68 - 121	3	35
Tetrachloroethene	1.0	U	10.0	9.39		ug/L		94	52 - 129	14	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.90		ug/L		99	69 - 126	1	35
Trichloroethene	1.0	U	10.0	9.24		ug/L		92	56 - 124	1	35
Vinyl chloride	1.0	U	10.0	8.23		ug/L		82	49 - 136	3	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	86		75 - 130
4-Bromofluorobenzene (Surr)	86		47 - 134
Toluene-d8 (Surr)	85		69 - 122
Dibromofluoromethane (Surr)	91		78 - 129

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-472900/5
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 12:29	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	82		70 - 133		02/12/21 12:29	1

Lab Sample ID: LCS 240-472900/4
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.6		ug/L		106	80 - 135

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	82		70 - 133

Lab Sample ID: 240-144376-F-3 MS
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	10.8		ug/L		108	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*

Lab Sample ID: 240-144376-F-3 MSD
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.8		ug/L		108	46 - 170	1	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

GC/MS VOA

Analysis Batch: 472900

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144367-2	MW-172S_020921	Total/NA	Water	8260B SIM	
MB 240-472900/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-472900/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144376-F-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144376-F-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 473065

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144367-1	TRIP BLANK	Total/NA	Water	8260B	
240-144367-2	MW-172S_020921	Total/NA	Water	8260B	
MB 240-473065/7	Method Blank	Total/NA	Water	8260B	
LCS 240-473065/4	Lab Control Sample	Total/NA	Water	8260B	
240-144376-H-3 MS	Matrix Spike	Total/NA	Water	8260B	
240-144376-I-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144367-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144367-1

Date Collected: 02/09/21 00:00
Matrix: Water
Date Received: 02/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473065	02/15/21 16:35	LRW	TAL CAN

Client Sample ID: MW-172S_020921

Lab Sample ID: 240-144367-2

Date Collected: 02/09/21 13:56
Matrix: Water
Date Received: 02/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473065	02/15/21 13:24	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	472900	02/12/21 19:13	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144367-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Gary Schafer		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

COC No:

of COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below

10 day ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day

Analyses

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM					Sample Specific Notes / Special Instructions:
TRIP BLANK	02/09/21			X						1							X	X	X	X	X	X	X					1 trip blank
MW-1725-020921	02/09/21	13:56		X						6							X	X	X	X	X	X	X					3 vaas for 8260B 3 vaas for 8260B SIM

240-144367 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	02/09/21 1800	Novi cold storage	Arcadis	02/09/21 1801
Julia McClafferty	Arcadis	2/10/2021 /	Amanda Battershell	ETA	2/10/21 10:12
Amanda Battershell	ETA	2/10/21 1309	Received in Laboratory by: Matthew	ETA	2-11-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 144367
Canton Facility

Client Arcadis Site Name

Cooler Received on 2-11-21 Opened on 2-11-21

Cooler unpacked by: Matt Snyder

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # VA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2.1 °C Corrected Cooler Temp. 2.2 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC907861
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 030301F	Yes	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

February 19, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144367-1
Sample date: 2021-02-09
Report received by CADENA: 2021-02-19
Initial Data Verification completed by CADENA: 2021-02-19
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144367-1

		Sample Name:	TRIP BLANK				MW-172S_020921			
		Lab Sample ID:	2401443671				2401443672			
		Sample Date:	2/9/2021				2/9/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS Design & Consultancy for natural and built assets

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

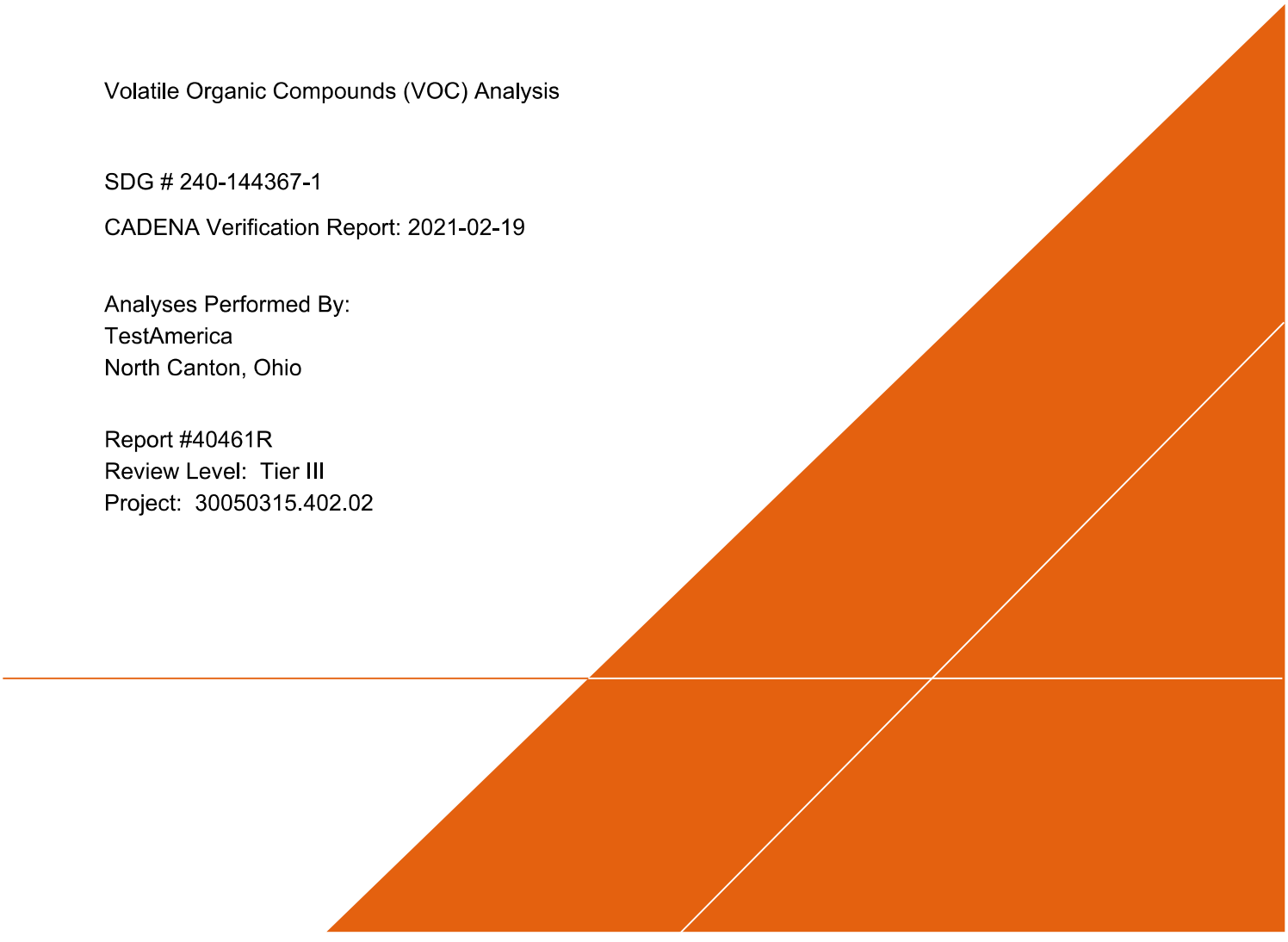
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144367-1

CADENA Verification Report: 2021-02-19

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report #40461R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144367-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					VOC
TRIP BLANK	240-144367-1	Water	02/09/2021		X
MW-172S_020921	240-144367-2	Water	02/09/2021		X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Prashanth K

SIGNATURE: 

DATE: March 09, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 10, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190

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THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: 10 day ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/09/21			X						1							X	X	X	X	X	X	X	1 trip blank
MW-1725-020921	02/09/21	13:56		X						6							X	X	X	X	X	X	X	3 vocs for 8260B 3 vocs for 8260B SIM

240-144367 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalla@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	02/09/21 1800	Novi cold storage	Arcadis	02/09/21 1801
Julia McClafferty	Arcadis	2/10/2021	Amanda Battershell	ETA	2/10/21 10:12
Amanda Battershell	ETA	2/10/21 1309	Received in Laboratory by: Matthew [signature]	ETA	2-11-21 800

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144367-1
Date Collected: 02/09/21 00:00
Matrix: Water
Date Received: 02/11/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 16:35	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 16:35	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 16:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 16:35	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 16:35	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 16:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*02/15/21 16:35*	*1*
4-Bromofluorobenzene (Surr)	*64*		*47 - 134*		*02/15/21 16:35*	*1*
Toluene-d8 (Surr)	*77*		*69 - 122*		*02/15/21 16:35*	*1*
Dibromofluoromethane (Surr)	*112*		*78 - 129*		*02/15/21 16:35*	*1*

Client Sample ID: MW-172S_020921
Lab Sample ID: 240-144367-2
Date Collected: 02/09/21 13:56
Matrix: Water
Date Received: 02/11/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 19:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/12/21 19:13*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 13:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 13:24	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 13:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 13:24	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 13:24	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 13:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*107*		*75 - 130*		*02/15/21 13:24*	*1*
4-Bromofluorobenzene (Surr)	*68*		*47 - 134*		*02/15/21 13:24*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*02/15/21 13:24*	*1*
Dibromofluoromethane (Surr)	*111*		*78 - 129*		*02/15/21 13:24*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144426-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
2/24/2021 11:12:55 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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Have a Question? Ask The Expert

Visit us at:
www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
F1	MS and/or MSD recovery exceeds control limits.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144426-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144426-1

Comments
No additional comments.

Receipt
The samples were received on 2/12/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.4° C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) associated with batch 473378 recovered above the upper control limit for 1,1-Dichloroethene. The samples associated with this CCV were non-detect for the affected analyte; therefore, the data have been reported. The associated samples are impacted: TRIP BLANK (240-144426-1) and MW-121S_021021 (240-144426-2).

Method 8260B: The laboratory control sample (LCS) for 473378 recovered outside control limits for the following analyte: 1,1-Dichloroethene. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported: TRIP BLANK (240-144426-1), MW-121S_021021 (240-144426-2) and (LCS 240-473378/4).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144426-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144426-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144426-1	TRIP BLANK	Water	02/10/21 00:00	02/12/21 08:00	
240-144426-2	MW-121S_021021	Water	02/10/21 10:56	02/12/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144426-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144426-1

No Detections.

Client Sample ID: MW-121S_021021 — Lab Sample ID: 240-144426-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144426-1

Client Sample ID: TRIP BLANK
Date Collected: 02/10/21 00:00
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144426-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/17/21 11:51	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 11:51	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 11:51	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 11:51	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 11:51	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 11:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*75 - 130*		*02/17/21 11:51*	*1*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*		*02/17/21 11:51*	*1*
Toluene-d8 (Surr)	*88*		*69 - 122*		*02/17/21 11:51*	*1*
Dibromofluoromethane (Surr)	*101*		*78 - 129*		*02/17/21 11:51*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144426-1

Client Sample ID: MW-121S_021021

Date Collected: 02/10/21 10:56
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144426-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 18:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*		*02/18/21 18:20*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/17/21 12:13	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 12:13	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 12:13	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 12:13	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 12:13	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 12:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*75 - 130*		*02/17/21 12:13*	*1*
4-Bromofluorobenzene (Surr)	*86*		*47 - 134*		*02/17/21 12:13*	*1*
Toluene-d8 (Surr)	*89*		*69 - 122*		*02/17/21 12:13*	*1*
Dibromofluoromethane (Surr)	*104*		*78 - 129*		*02/17/21 12:13*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144426-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144426-1	TRIP BLANK	119	89	88	101
240-144426-2	MW-121S_021021	119	86	89	104
240-144433-A-2 MS	Matrix Spike	108	108	96	96
240-144433-E-2 MSD	Matrix Spike Duplicate	106	108	97	96
LCS 240-473378/4	Lab Control Sample	108	109	99	98
MB 240-473378/7	Method Blank	112	88	88	96

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144425-C-2 MS	Matrix Spike	82
240-144425-C-2 MSD	Matrix Spike Duplicate	81
240-144426-2	MW-121S_021021	79
LCS 240-473604/4	Lab Control Sample	81
MB 240-473604/5	Method Blank	80

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473378/7
Matrix: Water
Analysis Batch: 473378

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 10:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 10:46	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 10:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 10:46	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 10:46	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 10:46	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*75 - 130*		*02/17/21 10:46*	*1*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*		*02/17/21 10:46*	*1*
Toluene-d8 (Surr)	*88*		*69 - 122*		*02/17/21 10:46*	*1*
Dibromofluoromethane (Surr)	*96*		*78 - 129*		*02/17/21 10:46*	*1*

Lab Sample ID: LCS 240-473378/4
Matrix: Water
Analysis Batch: 473378

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	15.6	*+	ug/L		156	73 - 129
cis-1,2-Dichloroethene	10.0	9.70		ug/L		97	75 - 124
Tetrachloroethene	10.0	9.82		ug/L		98	70 - 125
trans-1,2-Dichloroethene	10.0	9.77		ug/L		98	74 - 130
Trichloroethene	10.0	9.22		ug/L		92	71 - 121
Vinyl chloride	10.0	7.79		ug/L		78	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*108*		*75 - 130*
4-Bromofluorobenzene (Surr)	*109*		*47 - 134*
Toluene-d8 (Surr)	*99*		*69 - 122*
Dibromofluoromethane (Surr)	*98*		*78 - 129*

Lab Sample ID: 240-144433-A-2 MS
Matrix: Water
Analysis Batch: 473378

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U F1 *+	10.0	16.4	F1	ug/L		164	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	8.88		ug/L		89	68 - 121
Tetrachloroethene	1.0	U	10.0	8.79		ug/L		88	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	8.74		ug/L		87	69 - 126
Trichloroethene	1.0	U	10.0	8.38		ug/L		84	56 - 124
Vinyl chloride	1.0	U	10.0	6.85		ug/L		69	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*108*		*75 - 130*
4-Bromofluorobenzene (Surr)	*108*		*47 - 134*
Toluene-d8 (Surr)	*96*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144433-A-2 MS
Matrix: Water
Analysis Batch: 473378

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	96		78 - 129

Lab Sample ID: 240-144433-E-2 MSD
Matrix: Water
Analysis Batch: 473378

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U F1 *+	10.0	13.8	F1	ug/L		138	64 - 132	18	35
cis-1,2-Dichloroethene	1.0	U	10.0	8.85		ug/L		89	68 - 121	0	35
Tetrachloroethene	1.0	U	10.0	8.74		ug/L		87	52 - 129	1	35
trans-1,2-Dichloroethene	1.0	U	10.0	8.79		ug/L		88	69 - 126	1	35
Trichloroethene	1.0	U	10.0	8.35		ug/L		83	56 - 124	0	35
Vinyl chloride	1.0	U	10.0	6.56		ug/L		66	49 - 136	4	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	106		75 - 130
4-Bromofluorobenzene (Surr)	108		47 - 134
Toluene-d8 (Surr)	97		69 - 122
Dibromofluoromethane (Surr)	96		78 - 129

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473604/5
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 12:27	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	80		70 - 133		02/18/21 12:27	1

Lab Sample ID: LCS 240-473604/4
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.5		ug/L		105	80 - 135

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	81		70 - 133

Lab Sample ID: 240-144425-C-2 MS
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	11.1		ug/L		111	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144425-C-2 MSD
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.7		ug/L		107	46 - 170	3	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144426-1

GC/MS VOA

Analysis Batch: 473378

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144426-1	TRIP BLANK	Total/NA	Water	8260B	
240-144426-2	MW-121S_021021	Total/NA	Water	8260B	
MB 240-473378/7	Method Blank	Total/NA	Water	8260B	
LCS 240-473378/4	Lab Control Sample	Total/NA	Water	8260B	
240-144433-A-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144433-E-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 473604

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144426-2	MW-121S_021021	Total/NA	Water	8260B SIM	
MB 240-473604/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-473604/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144425-C-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144425-C-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144426-1

Client Sample ID: TRIP BLANK
Date Collected: 02/10/21 00:00
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144426-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473378	02/17/21 11:51	LEE	TAL CAN

Client Sample ID: MW-121S_021021
Date Collected: 02/10/21 10:56
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144426-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473378	02/17/21 12:13	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	473604	02/18/21 18:20	SAM	TAL CAN

Laboratory References:
TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144426-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

MICHIGAN 190

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Gary Schafer		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

COC No:

1 of 1 COCs

For lab use only
Walk-in client
Lab sampling
Job/SDG No:

Analysis Turnaround Time
TAT if different from below
10 day
☐ 3 weeks
☑ 2 weeks
☐ 1 week
☐ 2 days
☐ 1 day

Analyses

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/10/21	—		X1						1					N	G	X	X	X	X	X	X	X	TRIP BLANK
MW-1215-021021	02/10/21	10:56		X6						6					N	G	X	X	X	X	X	X	X	3 VOAS METHOD 8260B 3 VOAS METHOD 8260B SIM

240-144426 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	02/11/21 8:05	Novi Cold Storage	Arcadis	2/11/21 8:06
[signature]	ARCADIS	2/11/21 /0953	[signature]	ETA	2/11/21 0953
			Received in Laboratory by: [signature]	ETA	2-12-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative Login # : 144426
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Ryan C

Cooler Received on 2-12-21 Opened on 2-12-21 800

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TR Foam Box Client Cooler Box Other _____

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☑ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 0.3 °C Corrected Cooler Temp. 0.4 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 3	(Yes) No	
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes) No NA	
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes (No)	
-Were tamper/custody seals intact and uncompromised?	(Yes) No NA	
3. Shippers' packing slip attached to the cooler(s)?	Yes (No)	
4. Did custody papers accompany the sample(s)?	(Yes) No	
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes) No RDC 2-12-21	
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes) No	
7. Did all bottles arrive in good condition (Unbroken)?	(Yes) No	
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes) No	
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes) No	
11. Sufficient quantity received to perform indicated analyses?	(Yes) No	
12. Are these work share samples and all listed on the COC?	Yes (No)	
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No (NA)	pH Strip Lot# HC907861
14. Were VOAs on the COC?	(Yes) No	
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes (No) NA	
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 59072	(Yes) No	
17. Was a LL Hg or Me Hg trip blank present? _____	Yes (No)	

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

February 24, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144426-1
Sample date: 2021-02-10
Report received by CADENA: 2021-02-24
Initial Data Verification completed by CADENA: 2021-02-24
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 473378 LCS recoveries were outliers biased high for the following analyte: 1,1-DICHLOROETHENE. Associated client sample results were non-detect so qualification was not required based on this high bias QC outlier.

GCMS VOC QC batch MS/MSD recovery outliers were not determined using a client sample so qualification was not required based on these sample-specific QC outliers.

GCMS VOC QC batch CCV response outliers as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, MS/MSD Recovery, MS/MSD RPD, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144426-1

		Sample Name:	TRIP BLANK				MW-121S_021021			
		Lab Sample ID:	2401444261				2401444262			
		Sample Date:	2/10/2021				2/10/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS Design & Consultancy for natural and built assets

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

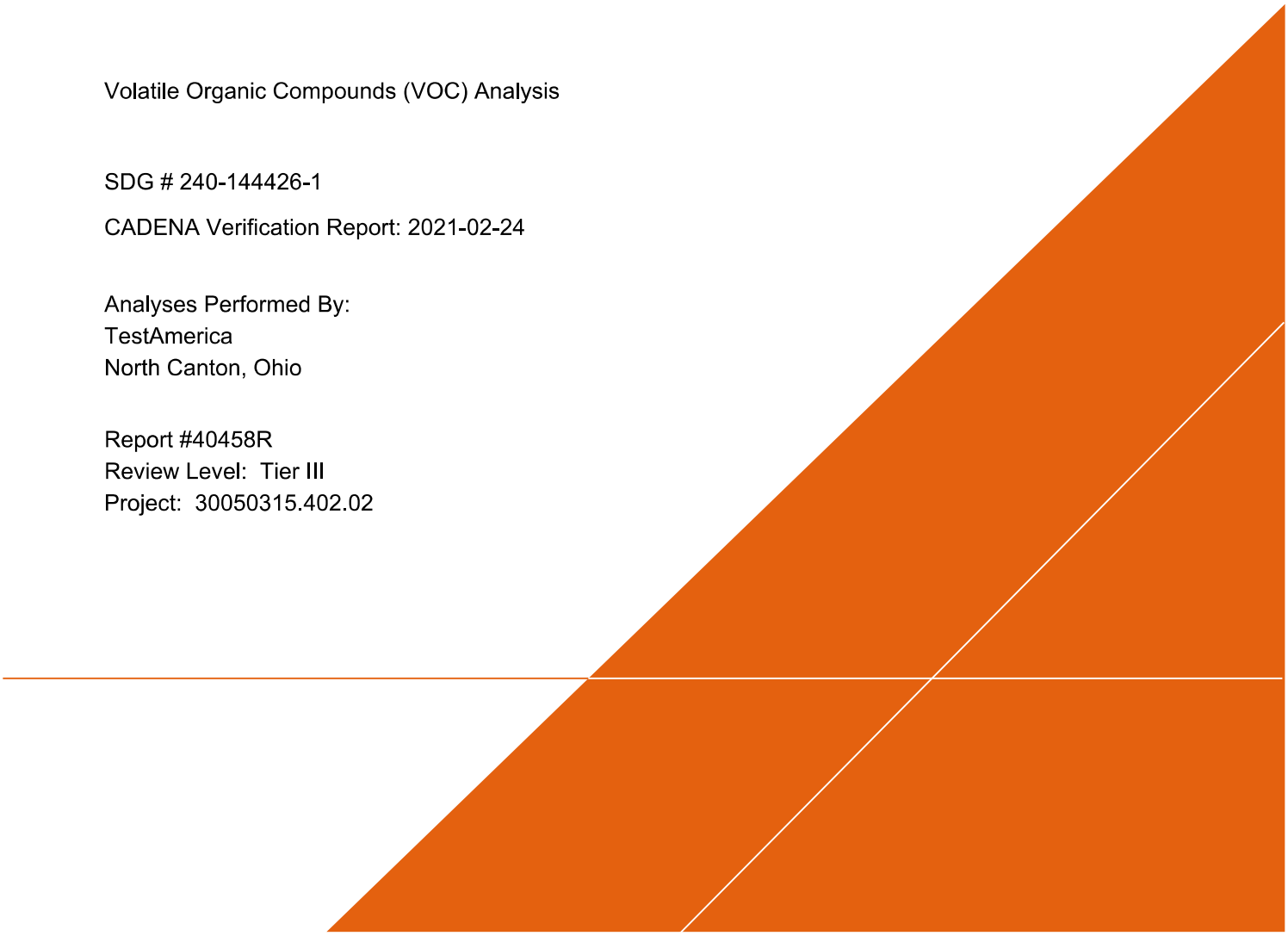
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144426-1

CADENA Verification Report: 2021-02-24

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report #40458R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144426-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					VOC
TRIP BLANK	240-144426-1	Water	02/10/2021		X
MW-121S_021021	240-144426-2	Water	02/10/2021		X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial/Continuing	Compound	Criteria
TRIP BLANK MW-121S_021021	CCV %D	1,1-Dichloroethene	+49.0%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J

Initial/Continuing	Criteria	Sample Result	Qualification
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1] RRF of 0.01 only applies to compounds which are typically poor responding compounds (i.e., ketones, 1,4-dioxane, etc.)

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Prashanth K

SIGNATURE: 

DATE: March 09, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 10, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Gary Schafer		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below

10 day

☐ 3 weeks
☑ 2 weeks
☐ 1 week
☐ 2 days
☐ 1 day

Sample Identification	Sample Date	Sample Time	Matrix: Air	Matrix: Aqueous	Matrix: Sediment	Matrix: Solid	Matrix: Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/10/21	—		X1						1					N	G	X	X	X	X	X	X	X	TRIP BLANK
MW-1215-021021	02/10/21	10:56		X6						6					N	G	X	X	X	X	X	X	X	3 VOAS METHOD 8260B 3 VOAS METHOD 8260B SIM

240-144426 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	02/11/21 8:05	Novi Cold Storage	Arcadis	2/11/21 8:06
[signature]	ARCADIS	2/11/21 /0953	[signature]	ETA	2/11/21 0953
			Received in Laboratory by: [signature]	ETA	2-12-21 800

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144426-1
Date Collected: 02/10/21 00:00
Matrix: Water
Date Received: 02/12/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 11:51	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 11:51	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 11:51	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 11:51	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 11:51	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 11:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*75 - 130*		*02/17/21 11:51*	*1*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*		*02/17/21 11:51*	*1*
Toluene-d8 (Surr)	*88*		*69 - 122*		*02/17/21 11:51*	*1*
Dibromofluoromethane (Surr)	*101*		*78 - 129*		*02/17/21 11:51*	*1*

Client Sample ID: MW-121S_021021
Lab Sample ID: 240-144426-2
Date Collected: 02/10/21 10:56
Matrix: Water
Date Received: 02/12/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 18:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*		*02/18/21 18:20*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 12:13	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 12:13	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 12:13	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 12:13	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 12:13	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 12:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*75 - 130*		*02/17/21 12:13*	*1*
4-Bromofluorobenzene (Surr)	*86*		*47 - 134*		*02/17/21 12:13*	*1*
Toluene-d8 (Surr)	*89*		*69 - 122*		*02/17/21 12:13*	*1*
Dibromofluoromethane (Surr)	*104*		*78 - 129*		*02/17/21 12:13*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144366-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
2/19/2021 11:38:11 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144366-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144366-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144366-1

Comments
No additional comments.

Receipt
The samples were received on 2/11/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.2° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144366-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144366-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144366-1	TRIP BLANK	Water	02/09/21 00:00	02/11/21 08:00	
240-144366-2	MW-173S_020921	Water	02/09/21 15:56	02/11/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144366-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144366-1

No Detections.

Client Sample ID: MW-173S_020921 — Lab Sample ID: 240-144366-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144366-1

Client Sample ID: TRIP BLANK
Date Collected: 02/09/21 00:00
Date Received: 02/11/21 08:00

Lab Sample ID: 240-144366-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 11:13	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 11:13	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 11:13	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 11:13	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 11:13	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 11:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 130*		*02/17/21 11:13*	*1*
4-Bromofluorobenzene (Surr)	*94*		*47 - 134*		*02/17/21 11:13*	*1*
Toluene-d8 (Surr)	*102*		*69 - 122*		*02/17/21 11:13*	*1*
Dibromofluoromethane (Surr)	*101*		*78 - 129*		*02/17/21 11:13*	*1*

Client Sample ID: MW-173S_020921
Date Collected: 02/09/21 15:56
Date Received: 02/11/21 08:00

Lab Sample ID: 240-144366-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 18:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/12/21 18:48*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 11:35	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 11:35	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 11:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 11:35	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 11:35	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 11:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 130*		*02/17/21 11:35*	*1*
4-Bromofluorobenzene (Surr)	*94*		*47 - 134*		*02/17/21 11:35*	*1*
Toluene-d8 (Surr)	*102*		*69 - 122*		*02/17/21 11:35*	*1*
Dibromofluoromethane (Surr)	*102*		*78 - 129*		*02/17/21 11:35*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144366-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144366-1	TRIP BLANK	98	94	102	101
240-144366-2	MW-173S_020921	98	94	102	102
240-144438-B-2 MS	Matrix Spike	90	89	97	96
240-144438-B-2 MSD	Matrix Spike Duplicate	87	83	92	90
LCS 240-473375/4	Lab Control Sample	93	96	100	98
MB 240-473375/6	Method Blank	99	96	104	99

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144366-2	MW-173S_020921	83
240-144376-F-3 MS	Matrix Spike	83
240-144376-F-3 MSD	Matrix Spike Duplicate	82
LCS 240-472900/4	Lab Control Sample	82
MB 240-472900/5	Method Blank	82

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473375/6
Matrix: Water
Analysis Batch: 473375

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 09:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 09:44	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 09:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 09:44	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 09:44	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 09:44	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*75 - 130*		*02/17/21 09:44*	*1*
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*		*02/17/21 09:44*	*1*
Toluene-d8 (Surr)	*104*		*69 - 122*		*02/17/21 09:44*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*02/17/21 09:44*	*1*

Lab Sample ID: LCS 240-473375/4
Matrix: Water
Analysis Batch: 473375

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.85		ug/L		98	73 - 129
cis-1,2-Dichloroethene	10.0	9.66		ug/L		97	75 - 124
Tetrachloroethene	10.0	10.4		ug/L		104	70 - 125
trans-1,2-Dichloroethene	10.0	9.74		ug/L		97	74 - 130
Trichloroethene	10.0	9.92		ug/L		99	71 - 121
Vinyl chloride	10.0	10.2		ug/L		102	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*
Toluene-d8 (Surr)	*100*		*69 - 122*
Dibromofluoromethane (Surr)	*98*		*78 - 129*

Lab Sample ID: 240-144438-B-2 MS
Matrix: Water
Analysis Batch: 473375

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1000	U	10000	8730		ug/L		87	64 - 132
cis-1,2-Dichloroethene	21000	F1	10000	26900	F1	ug/L		63	68 - 121
Tetrachloroethene	870	J	10000	9300		ug/L		84	52 - 129
trans-1,2-Dichloroethene	200	J	10000	8950		ug/L		87	69 - 126
Trichloroethene	6700		10000	14700		ug/L		80	56 - 124
Vinyl chloride	1000	U	10000	9030		ug/L		90	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*75 - 130*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*
Toluene-d8 (Surr)	*97*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144438-B-2 MS
Matrix: Water
Analysis Batch: 473375

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	96		78 - 129

Lab Sample ID: 240-144438-B-2 MSD
Matrix: Water
Analysis Batch: 473375

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1000	U	10000	9900		ug/L		99	64 - 132	13	35
cis-1,2-Dichloroethene	21000	F1	10000	29700		ug/L		91	68 - 121	10	35
Tetrachloroethene	870	J	10000	10900		ug/L		101	52 - 129	16	35
trans-1,2-Dichloroethene	200	J	10000	9770		ug/L		96	69 - 126	9	35
Trichloroethene	6700		10000	15400		ug/L		87	56 - 124	5	35
Vinyl chloride	1000	U	10000	9850		ug/L		99	49 - 136	9	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	87		75 - 130
4-Bromofluorobenzene (Surr)	83		47 - 134
Toluene-d8 (Surr)	92		69 - 122
Dibromofluoromethane (Surr)	90		78 - 129

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-472900/5
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 12:29	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	82		70 - 133		02/12/21 12:29	1

Lab Sample ID: LCS 240-472900/4
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.6		ug/L		106	80 - 135

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	82		70 - 133

Lab Sample ID: 240-144376-F-3 MS
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	10.8		ug/L		108	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*

Lab Sample ID: 240-144376-F-3 MSD
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.8		ug/L		108	46 - 170	1	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

GC/MS VOA

Analysis Batch: 472900

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144366-2	MW-173S_020921	Total/NA	Water	8260B SIM	
MB 240-472900/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-472900/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144376-F-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144376-F-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 473375

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144366-1	TRIP BLANK	Total/NA	Water	8260B	
240-144366-2	MW-173S_020921	Total/NA	Water	8260B	
MB 240-473375/6	Method Blank	Total/NA	Water	8260B	
LCS 240-473375/4	Lab Control Sample	Total/NA	Water	8260B	
240-144438-B-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144438-B-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144366-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144366-1

Date Collected: 02/09/21 00:00

Matrix: Water

Date Received: 02/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473375	02/17/21 11:13	LEE	TAL CAN

Client Sample ID: MW-173S_020921

Lab Sample ID: 240-144366-2

Date Collected: 02/09/21 15:56

Matrix: Water

Date Received: 02/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473375	02/17/21 11:35	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	472900	02/12/21 18:48	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144366-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

MICHIGAN 190 TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client:
Phone: 248-994-2240	Method of Shipment/Carrier:	10 day		Lab sampling:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/09/21			X						1							X	X	X	X	X	X	X	Trip blank
MW-1735-020921	02/09/21	15:56		X						6							X	X	X	X	X	X	X	3 vials for 8260B 3 vials for 8260B SIM

240-144366 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	02/09/21 1800	Novi cold storage	Arcadis	2/09/21 1801
Relinquished by: [signature]	Company: Arcadis	Date/Time: 2/10/2021	Received by: [signature]	Company: ETA	Date/Time: 2/10/21 10:12
Relinquished by: [signature]	Company: ETA	Date/Time: 2/10/21 1309	Received in Laboratory by: [signature]	Company: ETA	Date/Time: 2-11-21 800

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2/19/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 144360**
Canton Facility

Client Arcadis Site Name

Cooler Received on 2-11-21 Opened on 2-11-21

Cooler unpacked by: MattSnyder

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # VT Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2.1 °C Corrected Cooler Temp. 2.2 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC907861
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #0303101F	Yes	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

February 19, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144366-1
Sample date: 2021-02-09
Report received by CADENA: 2021-02-19
Initial Data Verification completed by CADENA: 2021-02-19
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch MS/MSD recovery outliers were not determined using a client sample so qualification was not required based on these sample-specific QC outliers.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144366-1

		Sample Name:	TRIP BLANK				MW-173S_020921			
		Lab Sample ID:	2401443661				2401443662			
		Sample Date:	2/9/2021				2/9/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS Design & Consultancy for natural and built assets

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

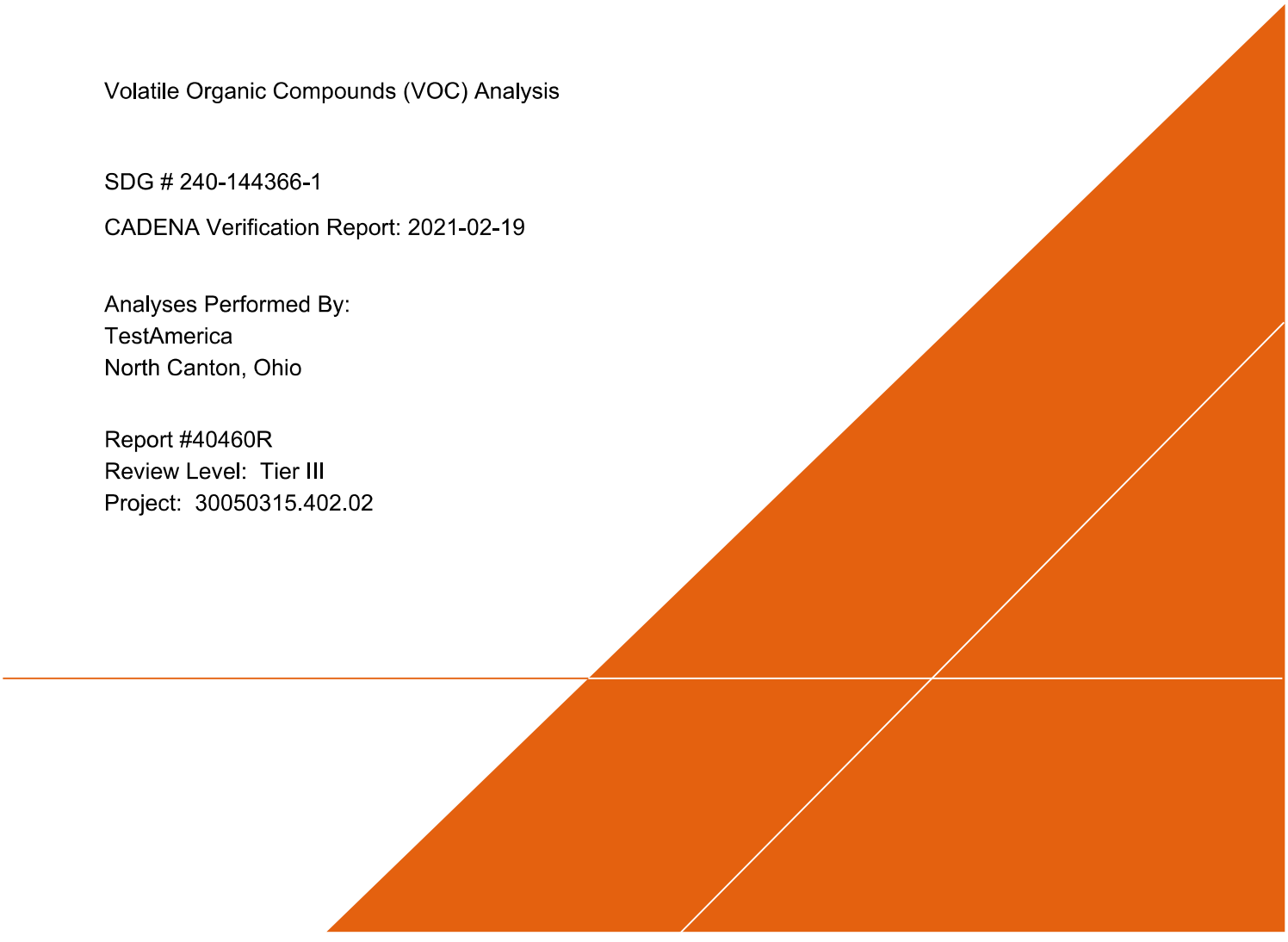
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144366-1

CADENA Verification Report: 2021-02-19

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report #40460R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144366-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					VOC
TRIP BLANK	240-144366-1	Water	02/09/2021		X
MW-173S_020921	240-144366-2	Water	02/09/2021		X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Prashanth K

SIGNATURE: 

DATE: March 09, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 10, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190 TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks; 10 day ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client: Lab sampling:
Phone: 248-994-2240	Method of Shipment/Carrier:			Job/SDG No:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/09/21			X						1							X	X	X	X	X	X	X	Trip blank
MW-1735-020921	02/09/21	15:56		X						6							X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-144366 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Arcadis	02/09/21 1800	Novi cold storage	Arcadis	02/09/21 1801
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Arcadis	2/10/2021		ETA	2/10/21 10:12
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
	ETA	2/10/21 1309		ETA	2-11-21 820

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02/19/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144366-1

Date Collected: 02/09/21 00:00
Matrix: Water
Date Received: 02/11/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 11:13	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 11:13	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 11:13	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 11:13	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 11:13	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 11:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 130*		*02/17/21 11:13*	*1*
4-Bromofluorobenzene (Surr)	*94*		*47 - 134*		*02/17/21 11:13*	*1*
Toluene-d8 (Surr)	*102*		*69 - 122*		*02/17/21 11:13*	*1*
Dibromofluoromethane (Surr)	*101*		*78 - 129*		*02/17/21 11:13*	*1*

Client Sample ID: MW-173S_020921
Lab Sample ID: 240-144366-2

Date Collected: 02/09/21 15:56
Matrix: Water
Date Received: 02/11/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 18:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/12/21 18:48*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 11:35	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 11:35	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 11:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 11:35	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 11:35	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 11:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 130*		*02/17/21 11:35*	*1*
4-Bromofluorobenzene (Surr)	*94*		*47 - 134*		*02/17/21 11:35*	*1*
Toluene-d8 (Surr)	*102*		*69 - 122*		*02/17/21 11:35*	*1*
Dibromofluoromethane (Surr)	*102*		*78 - 129*		*02/17/21 11:35*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144427-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
2/24/2021 11:13:24 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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Have a Question? Ask The Expert

Visit us at:
www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
F1	MS and/or MSD recovery exceeds control limits.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144427-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144427-1

Comments
No additional comments.

Receipt
The samples were received on 2/12/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.4° C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) associated with batch 473378 recovered above the upper control limit for 1,1-Dichloroethene. The samples associated with this CCV were non-detect for the affected analyte; therefore, the data have been reported. The associated samples are impacted: TRIP BLANK (240-144427-1) and MW-93S_021021 (240-144427-2).

Method 8260B: The laboratory control sample (LCS) for 473378 recovered outside control limits for the following analyte: 1,1-Dichloroethene. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported: TRIP BLANK (240-144427-1), MW-93S_021021 (240-144427-2) and (LCS 240-473378/4).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144427-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144427-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144427-1	TRIP BLANK	Water	02/10/21 00:00	02/12/21 08:00	
240-144427-2	MW-93S_021021	Water	02/10/21 13:11	02/12/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144427-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144427-1

No Detections.

Client Sample ID: MW-93S_021021 — Lab Sample ID: 240-144427-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144427-1

Client Sample ID: TRIP BLANK

Date Collected: 02/10/21 00:00
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144427-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/17/21 12:35	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 12:35	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 12:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 12:35	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 12:35	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 12:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*75 - 130*		*02/17/21 12:35*	*1*
4-Bromofluorobenzene (Surr)	*84*		*47 - 134*		*02/17/21 12:35*	*1*
Toluene-d8 (Surr)	*89*		*69 - 122*		*02/17/21 12:35*	*1*
Dibromofluoromethane (Surr)	*107*		*78 - 129*		*02/17/21 12:35*	*1*

Client Sample ID: MW-93S_021021

Date Collected: 02/10/21 13:11
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144427-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 18:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/18/21 18:46*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/17/21 12:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 12:57	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 12:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 12:57	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 12:57	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 12:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*75 - 130*		*02/17/21 12:57*	*1*
4-Bromofluorobenzene (Surr)	*86*		*47 - 134*		*02/17/21 12:57*	*1*
Toluene-d8 (Surr)	*88*		*69 - 122*		*02/17/21 12:57*	*1*
Dibromofluoromethane (Surr)	*104*		*78 - 129*		*02/17/21 12:57*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144427-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144427-1	TRIP BLANK	117	84	89	107
240-144427-2	MW-93S_021021	119	86	88	104
240-144433-A-2 MS	Matrix Spike	108	108	96	96
240-144433-E-2 MSD	Matrix Spike Duplicate	106	108	97	96
LCS 240-473378/4	Lab Control Sample	108	109	99	98
MB 240-473378/7	Method Blank	112	88	88	96

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144425-C-2 MS	Matrix Spike	82
240-144425-C-2 MSD	Matrix Spike Duplicate	81
240-144427-2	MW-93S_021021	80
LCS 240-473604/4	Lab Control Sample	81
MB 240-473604/5	Method Blank	80

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473378/7
Matrix: Water
Analysis Batch: 473378

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 10:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 10:46	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 10:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 10:46	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 10:46	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 10:46	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*75 - 130*		*02/17/21 10:46*	*1*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*		*02/17/21 10:46*	*1*
Toluene-d8 (Surr)	*88*		*69 - 122*		*02/17/21 10:46*	*1*
Dibromofluoromethane (Surr)	*96*		*78 - 129*		*02/17/21 10:46*	*1*

Lab Sample ID: LCS 240-473378/4
Matrix: Water
Analysis Batch: 473378

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	15.6	*+	ug/L		156	73 - 129
cis-1,2-Dichloroethene	10.0	9.70		ug/L		97	75 - 124
Tetrachloroethene	10.0	9.82		ug/L		98	70 - 125
trans-1,2-Dichloroethene	10.0	9.77		ug/L		98	74 - 130
Trichloroethene	10.0	9.22		ug/L		92	71 - 121
Vinyl chloride	10.0	7.79		ug/L		78	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*108*		*75 - 130*
4-Bromofluorobenzene (Surr)	*109*		*47 - 134*
Toluene-d8 (Surr)	*99*		*69 - 122*
Dibromofluoromethane (Surr)	*98*		*78 - 129*

Lab Sample ID: 240-144433-A-2 MS
Matrix: Water
Analysis Batch: 473378

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U F1 *+	10.0	16.4	F1	ug/L		164	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	8.88		ug/L		89	68 - 121
Tetrachloroethene	1.0	U	10.0	8.79		ug/L		88	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	8.74		ug/L		87	69 - 126
Trichloroethene	1.0	U	10.0	8.38		ug/L		84	56 - 124
Vinyl chloride	1.0	U	10.0	6.85		ug/L		69	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*108*		*75 - 130*
4-Bromofluorobenzene (Surr)	*108*		*47 - 134*
Toluene-d8 (Surr)	*96*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144433-A-2 MS
Matrix: Water
Analysis Batch: 473378

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	96		78 - 129

Lab Sample ID: 240-144433-E-2 MSD
Matrix: Water
Analysis Batch: 473378

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U F1 *+	10.0	13.8	F1	ug/L		138	64 - 132	18	35
cis-1,2-Dichloroethene	1.0	U	10.0	8.85		ug/L		89	68 - 121	0	35
Tetrachloroethene	1.0	U	10.0	8.74		ug/L		87	52 - 129	1	35
trans-1,2-Dichloroethene	1.0	U	10.0	8.79		ug/L		88	69 - 126	1	35
Trichloroethene	1.0	U	10.0	8.35		ug/L		83	56 - 124	0	35
Vinyl chloride	1.0	U	10.0	6.56		ug/L		66	49 - 136	4	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	106		75 - 130
4-Bromofluorobenzene (Surr)	108		47 - 134
Toluene-d8 (Surr)	97		69 - 122
Dibromofluoromethane (Surr)	96		78 - 129

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473604/5
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 12:27	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	80		70 - 133		02/18/21 12:27	1

Lab Sample ID: LCS 240-473604/4
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.5		ug/L		105	80 - 135

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	81		70 - 133

Lab Sample ID: 240-144425-C-2 MS
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	11.1		ug/L		111	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144425-C-2 MSD
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.7		ug/L		107	46 - 170	3	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144427-1

GC/MS VOA

Analysis Batch: 473378

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144427-1	TRIP BLANK	Total/NA	Water	8260B	
240-144427-2	MW-93S_021021	Total/NA	Water	8260B	
MB 240-473378/7	Method Blank	Total/NA	Water	8260B	
LCS 240-473378/4	Lab Control Sample	Total/NA	Water	8260B	
240-144433-A-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144433-E-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 473604

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144427-2	MW-93S_021021	Total/NA	Water	8260B SIM	
MB 240-473604/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-473604/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144425-C-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144425-C-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144427-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144427-1

Date Collected: 02/10/21 00:00

Matrix: Water

Date Received: 02/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473378	02/17/21 12:35	LEE	TAL CAN

Client Sample ID: MW-93S_021021

Lab Sample ID: 240-144427-2

Date Collected: 02/10/21 13:11

Matrix: Water

Date Received: 02/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473378	02/17/21 12:57	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	473604	02/18/21 18:46	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144427-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

MICHIGAN 190 TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Gary Schafer		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below: 10 day ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/10/21	—		X1						1					N	G	X	X	X	X	X	X	X	TRIP BLANK
MW-935_021021	02/10/21	1311		X6						6					N	G	X	X	X	X	X	X	X	3 VOAS METHOD 8260B 3 VOAS METHOD 8260B SIM

240-144427 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	02/11/21 8:05	Nav. Cord Storage	Arcadis	2/11/21 8:06
[signature]	ARCADIS	2/11/21 / 0953	[signature]	ETA	2/11/21 0953
			Received in Laboratory by: [signature]	ETA	2-12-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 144427**
Canton Facility

Client Arcadis Site Name

Cooler Received on 2-12-21 Opened on 2-12-21 800

Cooler unpacked by: Ryan C

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ■ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 0.3 °C Corrected Cooler Temp. 0.4 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 3	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	(No) RAC 2-12-21
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?	(Yes)	No
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 59072	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

February 24, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144427-1
Sample date: 2021-02-10
Report received by CADENA: 2021-02-24
Initial Data Verification completed by CADENA: 2021-02-24
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 473378 LCS recoveries were outliers biased high for the following analyte: 1,1-DICHLOROETHENE. Associated client sample results were non-detect so qualification was not required based on this high bias QC outlier.

GCMS VOC QC batch MS/MSD recovery outliers were not determined using a client sample so qualification was not required based on these sample-specific QC outliers.

GCMS VOC QC batch CCV response outliers as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, MS/MSD Recovery, MS/MSD RPD, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144427-1

		Sample Name:	TRIP BLANK				MW-93S_021021			
		Lab Sample ID:	2401444271				2401444272			
		Sample Date:	2/10/2021				2/10/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS Design & Consultancy for natural and built assets

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

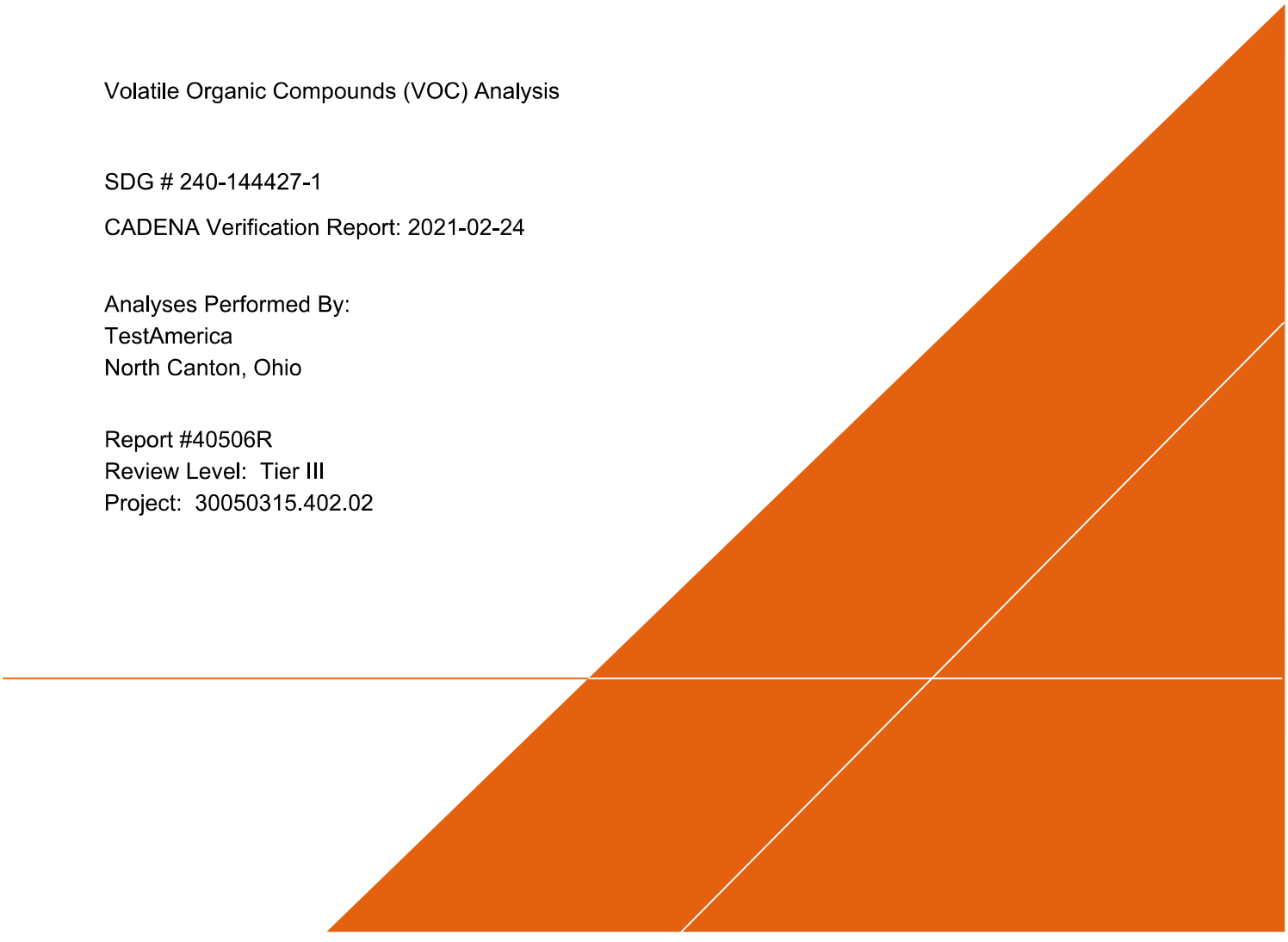
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144427-1

CADENA Verification Report: 2021-02-24

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report #40506R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144427-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					VOC
TRIP BLANK	240-144427-1	Water	02/10/2021		X
MW-93S_021021	240-144427-2	Water	02/10/2021		X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial/Continuing	Compound	Criteria
TRIP BLANK MW-93S_021021	CCV %D	1,1-Dichloroethene	+49.0%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J

Initial/Continuing	Criteria	Sample Result	Qualification
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1] RRF of 0.01 only applies to compounds which are typically poor responding compounds (i.e., ketones, 1,4-dioxane, etc.)

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Prashanth K

SIGNATURE: 

DATE: March 09, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 10, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190 TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Gary Schafer		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

COC No: 1 of 1 COCs

For lab use only: Walk-in client; Lab sampling; Job/SDG No:

Analysis Turnaround Time: TAT if different from below: 10 day ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day

Analyses

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/10/21	—		X1						1					N	G	X	X	X	X	X	X	X	TRIP BLANK
MW-935_021021	02/10/21	1311		X6						6					N	G	X	X	X	X	X	X	X	3 VOAS METHOD 8260B 3 VOAS METHOD 8260B SIM

240-144427 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	02/11/21 8:05	Nav. Cold Storage	Arcadis	2/11/21 8:06
[signature]	ARCADIS	2/11/21 / 0953	[signature]	ETA	2/11/21 0953
			Received in Laboratory by: [signature]	ETA	2-12-21 800

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02/24/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144427-1

Date Collected: 02/10/21 00:00
Matrix: Water
Date Received: 02/12/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 12:35	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 12:35	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 12:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 12:35	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 12:35	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 12:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*75 - 130*		*02/17/21 12:35*	*1*
4-Bromofluorobenzene (Surr)	*84*		*47 - 134*		*02/17/21 12:35*	*1*
Toluene-d8 (Surr)	*89*		*69 - 122*		*02/17/21 12:35*	*1*
Dibromofluoromethane (Surr)	*107*		*78 - 129*		*02/17/21 12:35*	*1*

Client Sample ID: MW-93S_021021
Lab Sample ID: 240-144427-2

Date Collected: 02/10/21 13:11
Matrix: Water
Date Received: 02/12/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 18:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/18/21 18:46*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 12:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 12:57	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 12:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 12:57	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 12:57	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 12:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*75 - 130*		*02/17/21 12:57*	*1*
4-Bromofluorobenzene (Surr)	*86*		*47 - 134*		*02/17/21 12:57*	*1*
Toluene-d8 (Surr)	*88*		*69 - 122*		*02/17/21 12:57*	*1*
Dibromofluoromethane (Surr)	*104*		*78 - 129*		*02/17/21 12:57*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144434-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
2/24/2021 11:21:43 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
F1	MS and/or MSD recovery exceeds control limits.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144434-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144434-1

Comments
No additional comments.

Receipt
The samples were received on 2/12/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.4° C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) associated with batch 473553 recovered above the upper control limit for 1,1-Dichloroethene. The samples associated with this CCV were non-detect for the affected analyte; therefore, the data have been reported. The associated samples are impacted: TRIP BLANK (240-144434-1) and MW-176S_021021 (240-144434-2).

Method 8260B: The laboratory control sample (LCS) for 473553 recovered outside control limits for the following analyte: 1,1-Dichloroethene. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported: TRIP BLANK (240-144434-1), MW-176S_021021 (240-144434-2) and (LCS 240-473553/4).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144434-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144434-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144434-1	TRIP BLANK	Water	02/10/21 00:00	02/12/21 08:00	
240-144434-2	MW-176S_021021	Water	02/10/21 15:31	02/12/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144434-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144434-1

No Detections.

Client Sample ID: MW-176S_021021 — Lab Sample ID: 240-144434-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144434-1

Client Sample ID: TRIP BLANK
Date Collected: 02/10/21 00:00
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144434-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/18/21 12:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/18/21 12:57	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/18/21 12:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 12:57	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/18/21 12:57	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/18/21 12:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*75 - 130*		*02/18/21 12:57*	*1*
4-Bromofluorobenzene (Surr)	*82*		*47 - 134*		*02/18/21 12:57*	*1*
Toluene-d8 (Surr)	*88*		*69 - 122*		*02/18/21 12:57*	*1*
Dibromofluoromethane (Surr)	*100*		*78 - 129*		*02/18/21 12:57*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144434-1

Client Sample ID: MW-176S_021021

Date Collected: 02/10/21 15:31
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144434-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 20:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/18/21 20:27*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/18/21 13:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/18/21 13:19	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/18/21 13:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 13:19	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/18/21 13:19	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/18/21 13:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*75 - 130*		*02/18/21 13:19*	*1*
4-Bromofluorobenzene (Surr)	*81*		*47 - 134*		*02/18/21 13:19*	*1*
Toluene-d8 (Surr)	*86*		*69 - 122*		*02/18/21 13:19*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*02/18/21 13:19*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144434-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144434-1	TRIP BLANK	117	82	88	100
240-144434-2	MW-176S_021021	117	81	86	99
240-144460-B-2 MS	Matrix Spike	111	110	100	102
240-144460-B-2 MSD	Matrix Spike Duplicate	104	107	99	95
LCS 240-473553/4	Lab Control Sample	105	107	96	95
MB 240-473553/7	Method Blank	116	86	91	101

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144425-C-2 MS	Matrix Spike	82
240-144425-C-2 MSD	Matrix Spike Duplicate	81
240-144434-2	MW-176S_021021	80
LCS 240-473604/4	Lab Control Sample	81
MB 240-473604/5	Method Blank	80

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473553/7
Matrix: Water
Analysis Batch: 473553

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 12:13	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/18/21 12:13	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/18/21 12:13	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 12:13	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/18/21 12:13	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/18/21 12:13	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*75 - 130*		*02/18/21 12:13*	*1*
4-Bromofluorobenzene (Surr)	*86*		*47 - 134*		*02/18/21 12:13*	*1*
Toluene-d8 (Surr)	*91*		*69 - 122*		*02/18/21 12:13*	*1*
Dibromofluoromethane (Surr)	*101*		*78 - 129*		*02/18/21 12:13*	*1*

Lab Sample ID: LCS 240-473553/4
Matrix: Water
Analysis Batch: 473553

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	17.3	*+	ug/L		173	73 - 129
cis-1,2-Dichloroethene	10.0	9.52		ug/L		95	75 - 124
Tetrachloroethene	10.0	9.34		ug/L		93	70 - 125
trans-1,2-Dichloroethene	10.0	9.59		ug/L		96	74 - 130
Trichloroethene	10.0	9.06		ug/L		91	71 - 121
Vinyl chloride	10.0	8.30		ug/L		83	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*105*		*75 - 130*
4-Bromofluorobenzene (Surr)	*107*		*47 - 134*
Toluene-d8 (Surr)	*96*		*69 - 122*
Dibromofluoromethane (Surr)	*95*		*78 - 129*

Lab Sample ID: 240-144460-B-2 MS
Matrix: Water
Analysis Batch: 473553

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	2500	U F1 *+	25000	35500	F1	ug/L		142	64 - 132
cis-1,2-Dichloroethene	2900		25000	25500		ug/L		91	68 - 121
Tetrachloroethene	2500	U	25000	21400		ug/L		86	52 - 129
Trichloroethene	50000		25000	65000		ug/L		59	56 - 124
Vinyl chloride	2500	U	25000	15800		ug/L		63	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*111*		*75 - 130*
4-Bromofluorobenzene (Surr)	*110*		*47 - 134*
Toluene-d8 (Surr)	*100*		*69 - 122*
Dibromofluoromethane (Surr)	*102*		*78 - 129*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144460-B-2 MSD
Matrix: Water
Analysis Batch: 473553

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	2500	U F1 *+	25000	38200	F1	ug/L		153	64 - 132	7	35
cis-1,2-Dichloroethene	2900		25000	26200		ug/L		93	68 - 121	2	35
Tetrachloroethene	2500	U	25000	24000		ug/L		96	52 - 129	12	35
Trichloroethene	50000		25000	65000		ug/L		59	56 - 124	0	35
Vinyl chloride	2500	U	25000	18200		ug/L		73	49 - 136	14	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*
4-Bromofluorobenzene (Surr)	*107*		*47 - 134*
Toluene-d8 (Surr)	*99*		*69 - 122*
Dibromofluoromethane (Surr)	*95*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473604/5
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 12:27	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/18/21 12:27*	*1*

Lab Sample ID: LCS 240-473604/4
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.5		ug/L		105	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

Lab Sample ID: 240-144425-C-2 MS
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	11.1		ug/L		111	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144425-C-2 MSD
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.7		ug/L		107	46 - 170	3	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144434-1

GC/MS VOA

Analysis Batch: 473553

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144434-1	TRIP BLANK	Total/NA	Water	8260B	
240-144434-2	MW-176S_021021	Total/NA	Water	8260B	
MB 240-473553/7	Method Blank	Total/NA	Water	8260B	
LCS 240-473553/4	Lab Control Sample	Total/NA	Water	8260B	
240-144460-B-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144460-B-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 473604

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144434-2	MW-176S_021021	Total/NA	Water	8260B SIM	
MB 240-473604/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-473604/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144425-C-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144425-C-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144434-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144434-1

Date Collected: 02/10/21 00:00
Matrix: Water
Date Received: 02/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473553	02/18/21 12:57	LEE	TAL CAN

Client Sample ID: MW-176S_021021

Lab Sample ID: 240-144434-2

Date Collected: 02/10/21 15:31
Matrix: Water
Date Received: 02/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473553	02/18/21 13:19	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	473604	02/18/21 20:27	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144434-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

MICHIGAN TestAmerica 190
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No: / 1 of 1 COCs
Phone: 248-994-2240	Sampler Name: Geary Schaefer	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day	For lab use only: Walk-in client; Lab sampling; Job/SDG No:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/10/21	—		1						1					N	G	X	X	X	X	X	X	X	TRIP BLANK
MW-1765-021021	02/10/21	15:31		6						6					N	G	X	X	X	X	X	X	X	3 VOAs METHOD 8260B 3 VOAs METHOD 8260B SIM

240-144434 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Geary Schaefer	Arcadis	02/10/21 8:05	Novi cold storage	Arcadis	2/11/21 8:00
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	ARCADIS	2/11/21 0953	[signature]	ETA	2/11/21 0953
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
			[signature]	ETA	2-12-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 144434**
Canton Facility

Client Aradis Site Name

Cooler Received on 2-12-21 Opened on 2-12-21 800

Cooler unpacked by: Ryan C

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ■ See Multiple Cooler Form
IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 0.3 °C Corrected Cooler Temp. 0.4 °C
IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 3 (Yes) No
-Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
-Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No RDC 2-12-21
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 59072 (Yes) No
17. Was a LL Hg or Me Hg trip blank present? ____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

February 24, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144434-1
Sample date: 2021-02-10
Report received by CADENA: 2021-02-24
Initial Data Verification completed by CADENA: 2021-02-24
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 473378 LCS recoveries were outliers biased high for the following analyte: 1,1-DICHLOROETHENE. Associated client sample results were non-detect so qualification was not required based on this high bias QC outlier.

GCMS VOC QC batch MS/MSD recovery outliers were not determined using a client sample so qualification was not required based on these sample-specific QC outliers.

GCMS VOC QC batch CCV response outliers as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144434-1

		Sample Name:	TRIP BLANK				MW-176S_021021			
		Lab Sample ID:	2401444341				2401444342			
		Sample Date:	2/10/2021				2/10/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

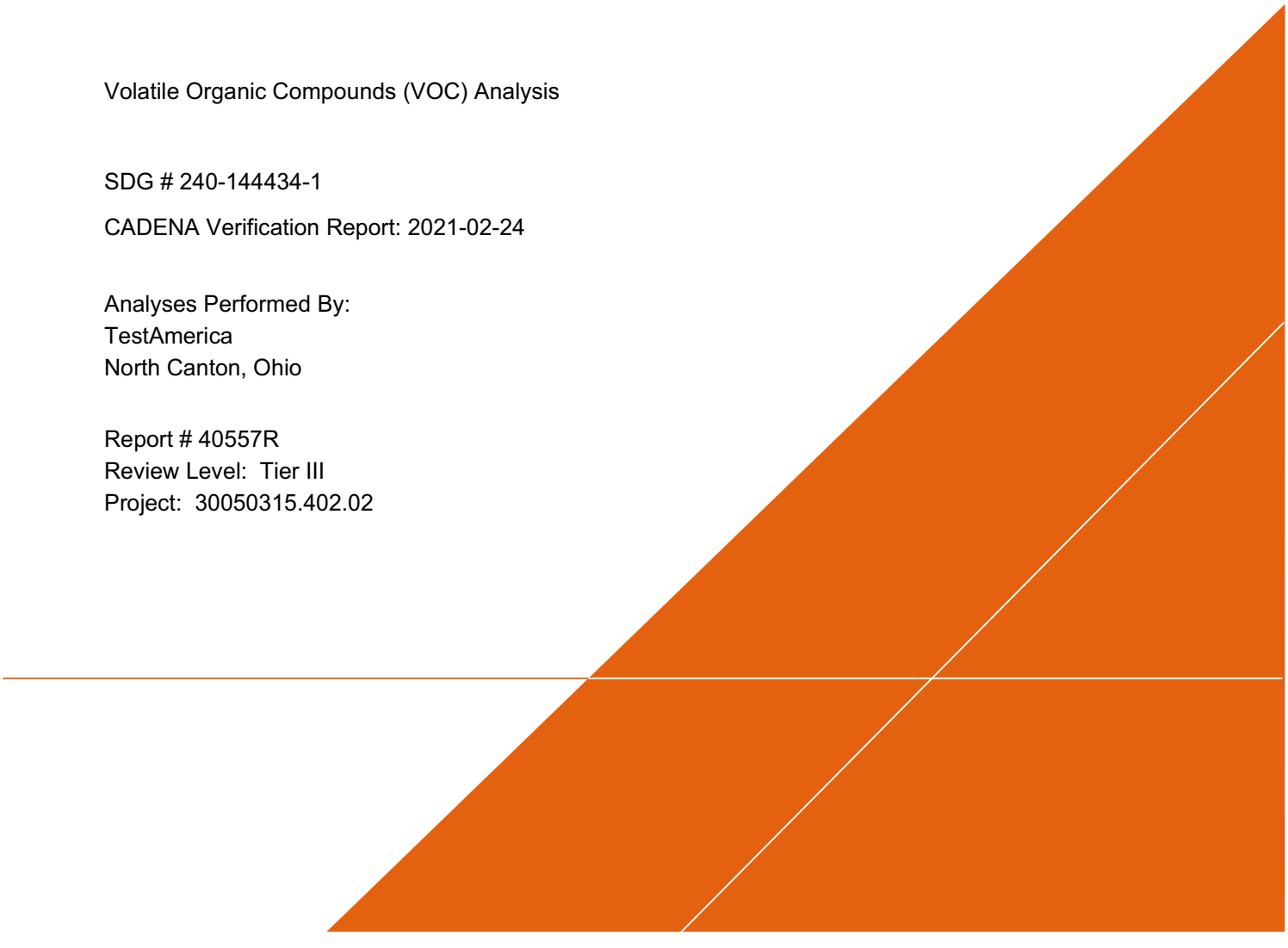
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144434-1

CADENA Verification Report: 2021-02-24

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40557R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144434-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144434-1	Water	02/10/2021		X	
MW-176S_021021	240-144434-2	Water	02/10/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial/Continuing	Compound	Criteria
TRIP BLANK MW-176S_021021	CCV %D	1,1-Dichloroethene	+47.8%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J

Initial/Continuing	Criteria	Sample Result	Qualification
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1] RRF of 0.01 only applies to compounds which are typically poor responding compounds (i.e., ketones, 1,4-dioxane, etc.)

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 17, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190 TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Gary Schafer		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below: 10 day ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/10/21	—		1						1					N	G	X	X	X	X	X	X	X	TRIP BLANK
MW-1765-021021	02/10/21	15:31		6 X						6					N	G	X	X	X	X	X	X	X	3 VOAS METHOD 8260B 3 VOAS METHOD 8260B SIM

240-144434 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	02/10/21 8:05	Novi cold storage	Arcadis	2/11/21 8:06
Christine Allen	ARCADIS	2/11/21/0953	Amanda Battishill	ETA	2/11/21 0953
			Received in Laboratory by: [signature]	ETA	2-12-21 800

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144434-1
Date Collected: 02/10/21 00:00
Matrix: Water
Date Received: 02/12/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/18/21 12:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/18/21 12:57	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/18/21 12:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 12:57	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/18/21 12:57	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/18/21 12:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*75 - 130*		*02/18/21 12:57*	*1*
4-Bromofluorobenzene (Surr)	*82*		*47 - 134*		*02/18/21 12:57*	*1*
Toluene-d8 (Surr)	*88*		*69 - 122*		*02/18/21 12:57*	*1*
Dibromofluoromethane (Surr)	*100*		*78 - 129*		*02/18/21 12:57*	*1*

Client Sample ID: MW-176S_021021
Lab Sample ID: 240-144434-2
Date Collected: 02/10/21 15:31
Matrix: Water
Date Received: 02/12/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 20:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/18/21 20:27*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/18/21 13:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/18/21 13:19	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/18/21 13:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 13:19	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/18/21 13:19	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/18/21 13:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*75 - 130*		*02/18/21 13:19*	*1*
4-Bromofluorobenzene (Surr)	*81*		*47 - 134*		*02/18/21 13:19*	*1*
Toluene-d8 (Surr)	*86*		*69 - 122*		*02/18/21 13:19*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*02/18/21 13:19*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144664-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/5/2021 2:28:25 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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Visit us at:
www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144664-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144664-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144664-1

Comments
No additional comments.

Receipt
The samples were received on 2/19/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.5° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144664-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144664-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144664-1	TRIP BLANK	Water	02/17/21 00:00	02/19/21 08:00	
240-144664-2	MW-178S_021721	Water	02/17/21 13:36	02/19/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144664-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144664-1

No Detections.

Client Sample ID: MW-178S_021721 — Lab Sample ID: 240-144664-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144664-1

Client Sample ID: TRIP BLANK

Date Collected: 02/17/21 00:00
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144664-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 18:34	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 18:34	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 18:34	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 18:34	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 18:34	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 18:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*02/25/21 18:34*	*1*
4-Bromofluorobenzene (Surr)	*67*		*47 - 134*		*02/25/21 18:34*	*1*
Toluene-d8 (Surr)	*79*		*69 - 122*		*02/25/21 18:34*	*1*
Dibromofluoromethane (Surr)	*108*		*78 - 129*		*02/25/21 18:34*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144664-1

Client Sample ID: MW-178S_021721
Date Collected: 02/17/21 13:36
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144664-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 17:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/25/21 17:20*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 20:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 20:57	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 20:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 20:57	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 20:57	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 20:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*111*		*75 - 130*		*02/25/21 20:57*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*02/25/21 20:57*	*1*
Toluene-d8 (Surr)	*78*		*69 - 122*		*02/25/21 20:57*	*1*
Dibromofluoromethane (Surr)	*109*		*78 - 129*		*02/25/21 20:57*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144664-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144664-1	TRIP BLANK	104	67	79	108
240-144664-2	MW-178S_021721	111	65	78	109
240-144711-E-2 MS	Matrix Spike	93	88	91	94
240-144711-F-2 MSD	Matrix Spike Duplicate	91	92	91	92
LCS 240-474507/4	Lab Control Sample	88	88	88	91
MB 240-474507/7	Method Blank	102	68	80	101

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144568-J-3 MS	Matrix Spike	79
240-144568-J-3 MSD	Matrix Spike Duplicate	83
240-144664-2	MW-178S_021721	82
LCS 240-474490/4	Lab Control Sample	79
MB 240-474490/5	Method Blank	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474507/7
Matrix: Water
Analysis Batch: 474507

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 17:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 17:22	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 17:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 17:22	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 17:22	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 17:22	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*75 - 130*		*02/25/21 17:22*	*1*
4-Bromofluorobenzene (Surr)	*68*		*47 - 134*		*02/25/21 17:22*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*02/25/21 17:22*	*1*
Dibromofluoromethane (Surr)	*101*		*78 - 129*		*02/25/21 17:22*	*1*

Lab Sample ID: LCS 240-474507/4
Matrix: Water
Analysis Batch: 474507

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.27		ug/L		93	73 - 129
cis-1,2-Dichloroethene	10.0	9.22		ug/L		92	75 - 124
Tetrachloroethene	10.0	11.5		ug/L		115	70 - 125
trans-1,2-Dichloroethene	10.0	9.77		ug/L		98	74 - 130
Trichloroethene	10.0	9.71		ug/L		97	71 - 121
Vinyl chloride	10.0	8.03		ug/L		80	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 130*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*
Toluene-d8 (Surr)	*88*		*69 - 122*
Dibromofluoromethane (Surr)	*91*		*78 - 129*

Lab Sample ID: 240-144711-E-2 MS
Matrix: Water
Analysis Batch: 474507

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	8.83		ug/L		88	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	8.92		ug/L		89	68 - 121
Tetrachloroethene	1.0	U	10.0	11.2		ug/L		112	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.58		ug/L		96	69 - 126
Trichloroethene	1.0	U	10.0	9.00		ug/L		90	56 - 124
Vinyl chloride	1.0	U	10.0	8.39		ug/L		84	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*
Toluene-d8 (Surr)	*91*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144711-E-2 MS
Matrix: Water
Analysis Batch: 474507

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*94*		*78 - 129*

Lab Sample ID: 240-144711-F-2 MSD
Matrix: Water
Analysis Batch: 474507

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.03		ug/L		90	64 - 132	2	35
cis-1,2-Dichloroethene	1.0	U	10.0	9.44		ug/L		94	68 - 121	6	35
Tetrachloroethene	1.0	U	10.0	11.3		ug/L		113	52 - 129	1	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.55		ug/L		96	69 - 126	0	35
Trichloroethene	1.0	U	10.0	9.26		ug/L		93	56 - 124	3	35
Vinyl chloride	1.0	U	10.0	8.55		ug/L		86	49 - 136	2	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*91*		*75 - 130*
4-Bromofluorobenzene (Surr)	*92*		*47 - 134*
Toluene-d8 (Surr)	*91*		*69 - 122*
Dibromofluoromethane (Surr)	*92*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474490/5
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 12:43	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/25/21 12:43*	*1*

Lab Sample ID: LCS 240-474490/4
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.7		ug/L		107	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*

Lab Sample ID: 240-144568-J-3 MS
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	10.2		ug/L		102	46 - 170		

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*

Lab Sample ID: 240-144568-J-3 MSD
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.2		ug/L		102	46 - 170	0	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*

GC/MS VOA

Analysis Batch: 474490

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144664-2	MW-178S_021721	Total/NA	Water	8260B SIM	
MB 240-474490/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474490/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144568-J-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144568-J-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474507

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144664-1	TRIP BLANK	Total/NA	Water	8260B	
240-144664-2	MW-178S_021721	Total/NA	Water	8260B	
MB 240-474507/7	Method Blank	Total/NA	Water	8260B	
LCS 240-474507/4	Lab Control Sample	Total/NA	Water	8260B	
240-144711-E-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144711-F-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144664-1

Client Sample ID: TRIP BLANK
Date Collected: 02/17/21 00:00
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144664-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474507	02/25/21 18:34	LRW	TAL CAN

Client Sample ID: MW-178S_021721
Date Collected: 02/17/21 13:36
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144664-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474507	02/25/21 20:57	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474490	02/25/21 17:20	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144664-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

MICHIGAN TestAmerica 190

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				/ of / COCs
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	For lab use only
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		Walk-in client
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: 10 day; ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30050315.402.04	Shipping/Tracking No:			
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/17/21	—		X						1							X	X	X	X	X	X	X	
MW-1785-021721	02/17/21	13:36		X						6					N	G	X	X	X	X	X	X	X	Method 8260B - 3 vials " 8260B SIM 3 vials

240-144664 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	02/17/21 1716	Novi cold Storage	Arcadis	02/17/21 1714
Julia McClafferty	Arcadis	2/18/2021	Amanda Battershell	ETA	2/18/21 10:18
Amanda Battershell	ETA	2/18/21 10:38	Received in Laboratory by:	TA	2/19/21 800

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3/5/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 144664
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by:

Cooler Received on 2-19-21 Opened on 2-19-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.4 °C Corrected Cooler Temp. 1.5 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC907861
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

March 05, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144664-1
Sample date: 2021-02-17
Report received by CADENA: 2021-03-05
Initial Data Verification completed by CADENA: 2021-03-05
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144664-1

		Sample Name:	TRIP BLANK				MW-178S_021721			
		Lab Sample ID:	2401446641				2401446642			
		Sample Date:	2/17/2021				2/17/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

SHALLOW LOW-FLOW GROUNDWATER SAMPLING FORM

Project No.	30050315.402.01	Well ID	MW-178S			Date	2-17-21
Project Name/Location		Ford LTP		Weather	12.9 degrees F and Mostly Cloudy. The wind is blowing S/SW at 3.4 mph.		
Measuring Pt. Description	Top of Casing	Screen Setting (ft-bmp)	4.5-9.5	Casing Diameter (in.)	2	Well Material	PVC
Static Water Level (ft-bmp)	6.50	Total Depth (ft-bmp)	8.83	Water Column (ft.)	2.33	Gallons in Well	0.38
		Pump Intake (ft-bmp)	8.00	Purge Method	Low-Flow	Sample Method	Grab
		Well Volumes Purged	4.92				
Sample Time: Label	13:36	Volume Purged	1.87 gallons	Replicate/Code No.	--	Sampled by	Gary Schafer
Purge Start	12:38						
Purge End	13:58						



Time	Minutes Elapsed between Readings	Flow Rate (mL/min) [100-300 mL/min]	Depth to Water (ft) [± 0.3]	Total Gallons Purged	pH [± 0.1]	Cond. (mS/cm) [± 3%]	Turbidity (NTU) [± 10%*]	DO (mg/L) [± 10%]	Temp. (°C) [± 3%]	Redox (mV) [± 10mV]	Appearance	
											Color	Odor
12:40	0	125	6.54	0.00	7.33	0.61	141.00	1.90	7.4	-22.8	Brown, Cloudy	Faint Odor
12:45	5	125	6.54	0.17	7.37	0.62	83.40	1.17	7.4	-30.3	Brown, Cloudy	No Odor
12:50	5	125	6.54	0.34	7.39	0.62	32.60	0.98	7.3	-29.2	Brown, Clear	No Odor
12:55	5	125	6.54	0.51	7.40	0.62	23.80	0.94	7.4	-28.8	Brown, Clear	No Odor
13:00	5	125	6.54	0.68	7.41	0.62	17.60	0.81	7.1	-27.7	Brown, Clear	No Odor
13:05	5	125	6.54	0.85	7.41	0.62	11.80	0.86	6.9	-26.6	Clear	No Odor
13:10	5	125	6.54	1.02	7.41	0.62	7.64	0.84	7.0	-26.1	Clear	No Odor
13:15	5	125	6.54	1.19	7.42	0.62	5.54	0.75	7.0	-25.4	Clear	No Odor
13:20	5	125	6.54	1.36	7.42	0.62	5.12	0.76	7.1	-24.5	Clear	No Odor
13:25	5	125	6.54	1.53	7.43	0.62	4.16	0.70	7.2	-24.3	Clear	No Odor
13:30	5	125	6.54	1.70	7.44	0.62	3.34	0.69	7.0	-23.6	Clear	No Odor
13:35	5	125	6.54	1.87	7.44	0.62	2.45	0.70	7.1	-22.7	Clear	No Odor
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* **Turbidity** < 50 NTU and ±10% or within 1 NTU of a previous reading when <10 NTU

Constituents Sampled	Container	Number	Preservative
1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, PCE, TCE, VC	40 mL Glass	3	HCL
1,4-dioxane	40 mL Glass	3	HCL

Comments

None

Well Casing Volumes

Gallons/Foot					
	1" = 0.04	*1.5" = 0.09*	*2.5" = 0.26*	*3.5" = 0.50*	*6" = 1.47*
	1.25" = 0.06	*2" = 0.16*	*3" = 0.37*	*4" = 0.65*	

Well Information

Well Location:	11850 Boston Post	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Flush mount	Lock Functioning:	yes

SHALLOW LOW-FLOW GROUNDWATER SAMPLING FORM

Project No.: 30050315.402.01 Page 1 of 1

Site Location: Ford LTP 11850 Boston Post

Prepared By: Gary Schafer

Date	Time	Description of Activities
2/17/2021	12:10	Arrive onsite
2/17/2021	12:21	Record static depth to water
2/17/2021	12:38	Begin purging well
2/17/2021	13:36	Collect sample MW-178S_021721
2/17/2021	13:58	End purge and turn off pump, begin decon of equipment
2/17/2021	14:20	Offsite
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ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

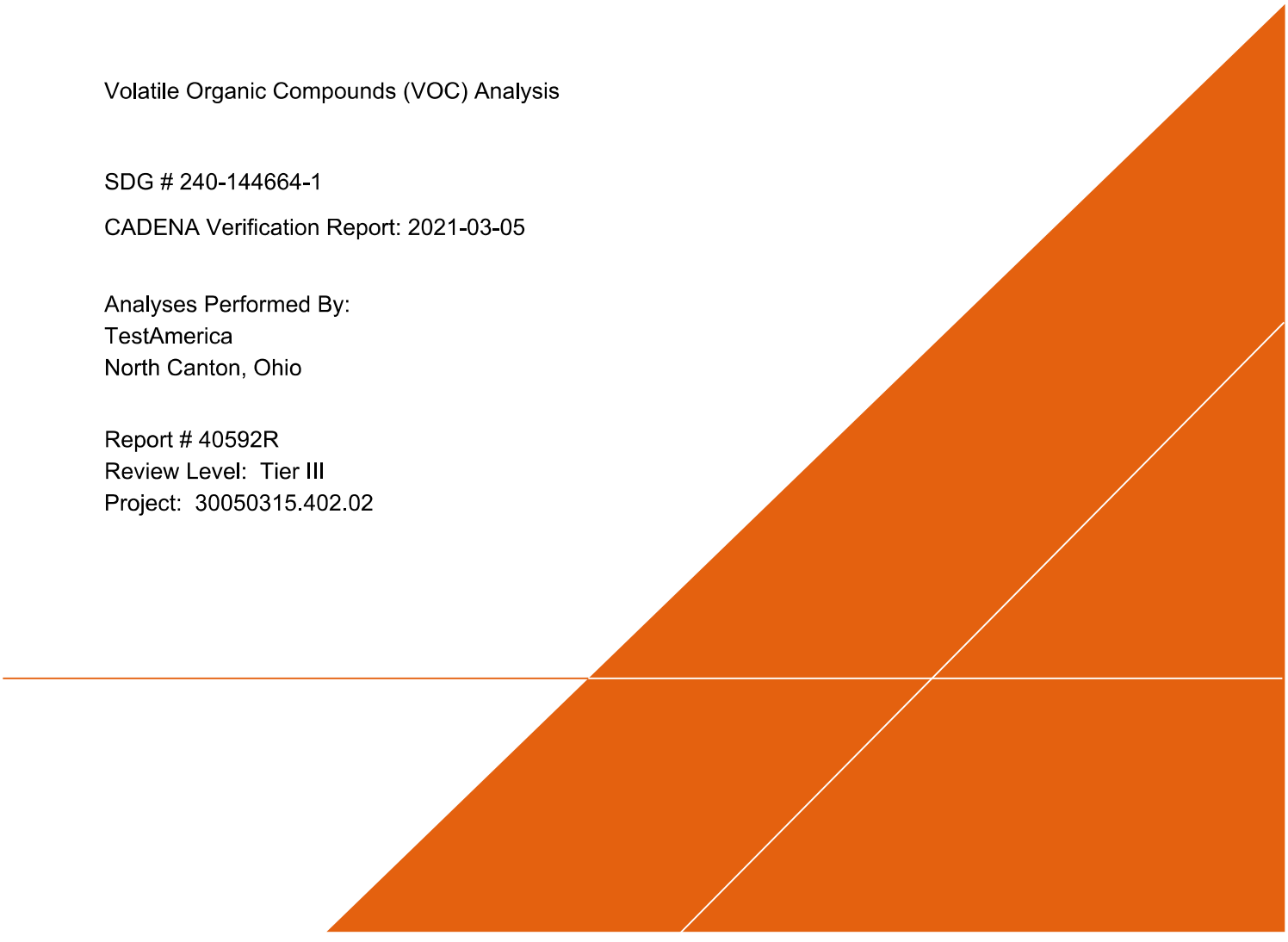
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144664-1

CADENA Verification Report: 2021-03-05

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40592R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144664-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144664-1	Water	02/17/2021		X	
MW-178S_021721	240-144664-2	Water	02/17/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 17, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 18, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144505-1
Client Project/Site: Ford LTP - Off Site
Revision: 1

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/26/2021 9:07:58 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144505-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144505-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144505-1

Comments
No additional comments.

Revision
The report being provided is a revision of the original report sent on 2/25/2021. The report (revision 1) is being revised due to: Samples mislabeled during unpacking - revised to correct data..

Receipt
The samples were received on 2/13/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.6° C.

GC/MS VOA
Method 8260B: The following sample was analyzed outside of analytical holding time due to mis-labeled vial: TRIP BLANK (240-144505-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144505-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144505-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144505-1	TRIP BLANK	Water	02/11/21 00:00	02/13/21 08:00	
240-144505-2	MW-177S_021121	Water	02/11/21 11:01	02/13/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144505-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144505-1

No Detections.

Client Sample ID: MW-177S_021121 — Lab Sample ID: 240-144505-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144505-1

Client Sample ID: TRIP BLANK
Date Collected: 02/11/21 00:00
Date Received: 02/13/21 08:00

Lab Sample ID: 240-144505-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U H	1.0	0.19	ug/L			03/15/21 17:21	1
cis-1,2-Dichloroethene	1.0	U H	1.0	0.16	ug/L			03/15/21 17:21	1
Tetrachloroethene	1.0	U H	1.0	0.15	ug/L			03/15/21 17:21	1
trans-1,2-Dichloroethene	1.0	U H	1.0	0.19	ug/L			03/15/21 17:21	1
Trichloroethene	1.0	U H	1.0	0.10	ug/L			03/15/21 17:21	1
Vinyl chloride	1.0	U H	1.0	0.20	ug/L			03/15/21 17:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*75 - 130*		*03/15/21 17:21*	*1*
4-Bromofluorobenzene (Surr)	*94*		*47 - 134*		*03/15/21 17:21*	*1*
Toluene-d8 (Surr)	*97*		*69 - 122*		*03/15/21 17:21*	*1*
Dibromofluoromethane (Surr)	*85*		*78 - 129*		*03/15/21 17:21*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144505-1

Client Sample ID: MW-177S_021121

Date Collected: 02/11/21 11:01
Date Received: 02/13/21 08:00

Lab Sample ID: 240-144505-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/19/21 12:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/19/21 12:24*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 21:11	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 21:11	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 21:11	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 21:11	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 21:11	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/22/21 21:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*02/22/21 21:11*	*1*
4-Bromofluorobenzene (Surr)	*63*		*47 - 134*		*02/22/21 21:11*	*1*
Toluene-d8 (Surr)	*75*		*69 - 122*		*02/22/21 21:11*	*1*
Dibromofluoromethane (Surr)	*118*		*78 - 129*		*02/22/21 21:11*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144505-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
190-25454-E-1 MS	Matrix Spike	79	97	95	83
190-25454-F-1 MSD	Matrix Spike Duplicate	84	95	95	86
240-144505-1	TRIP BLANK	82	94	97	85
240-144505-2	MW-177S_021121	104	63	75	118
240-144518-G-2 MSD	Matrix Spike Duplicate	80	87	87	96
240-144518-H-2 MS	Matrix Spike	88	96	91	95
LCS 240-473958/4	Lab Control Sample	91	90	88	95
LCS 240-476776/4	Lab Control Sample	78	94	97	83
MB 240-473958/7	Method Blank	112	68	79	114
MB 240-476776/7	Method Blank	80	91	98	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144505-2	MW-177S_021121	80
240-144515-J-3 MS	Matrix Spike	82
240-144515-J-3 MSD	Matrix Spike Duplicate	80
LCS 240-473720/4	Lab Control Sample	82
MB 240-473720/5	Method Blank	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473958/7
Matrix: Water
Analysis Batch: 473958

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 16:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 16:24	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 16:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 16:24	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 16:24	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/22/21 16:24	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*75 - 130*		*02/22/21 16:24*	*1*
4-Bromofluorobenzene (Surr)	*68*		*47 - 134*		*02/22/21 16:24*	*1*
Toluene-d8 (Surr)	*79*		*69 - 122*		*02/22/21 16:24*	*1*
Dibromofluoromethane (Surr)	*114*		*78 - 129*		*02/22/21 16:24*	*1*

Lab Sample ID: LCS 240-473958/4
Matrix: Water
Analysis Batch: 473958

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.9		ug/L		109	73 - 129
cis-1,2-Dichloroethene	10.0	10.0		ug/L		100	75 - 124
Tetrachloroethene	10.0	12.2		ug/L		122	70 - 125
trans-1,2-Dichloroethene	10.0	11.0		ug/L		110	74 - 130
Trichloroethene	10.0	10.1		ug/L		101	71 - 121
Vinyl chloride	10.0	9.31		ug/L		93	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*91*		*75 - 130*
4-Bromofluorobenzene (Surr)	*90*		*47 - 134*
Toluene-d8 (Surr)	*88*		*69 - 122*
Dibromofluoromethane (Surr)	*95*		*78 - 129*

Lab Sample ID: 240-144518-G-2 MSD
Matrix: Water
Analysis Batch: 473958

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.98		ug/L		100	64 - 132	3	35
cis-1,2-Dichloroethene	1.0	U	10.0	10.1		ug/L		101	68 - 121	7	35
Tetrachloroethene	1.0	U	10.0	10.7		ug/L		107	52 - 129	2	35
trans-1,2-Dichloroethene	1.0	U	10.0	10.2		ug/L		102	69 - 126	2	35
Trichloroethene	1.0	U	10.0	9.58		ug/L		96	56 - 124	1	35
Vinyl chloride	1.0	U	10.0	9.46		ug/L		95	49 - 136	3	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*80*		*75 - 130*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*
Toluene-d8 (Surr)	*87*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144518-G-2 MSD
Matrix: Water
Analysis Batch: 473958

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*96*		*78 - 129*

Lab Sample ID: 240-144518-H-2 MS
Matrix: Water
Analysis Batch: 473958

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.71		ug/L		97	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	9.40		ug/L		94	68 - 121
Tetrachloroethene	1.0	U	10.0	11.0		ug/L		110	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	69 - 126
Trichloroethene	1.0	U	10.0	9.67		ug/L		97	56 - 124
Vinyl chloride	1.0	U	10.0	9.16		ug/L		92	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 130*
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*
Toluene-d8 (Surr)	*91*		*69 - 122*
Dibromofluoromethane (Surr)	*95*		*78 - 129*

Lab Sample ID: MB 240-476776/7
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/15/21 15:40	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/15/21 15:40	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/15/21 15:40	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/15/21 15:40	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/15/21 15:40	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/15/21 15:40	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*75 - 130*		*03/15/21 15:40*	*1*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*		*03/15/21 15:40*	*1*
Toluene-d8 (Surr)	*98*		*69 - 122*		*03/15/21 15:40*	*1*
Dibromofluoromethane (Surr)	*81*		*78 - 129*		*03/15/21 15:40*	*1*

Lab Sample ID: LCS 240-476776/4
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.48		ug/L		85	73 - 129
cis-1,2-Dichloroethene	10.0	9.17		ug/L		92	75 - 124
Tetrachloroethene	10.0	10.2		ug/L		102	70 - 125
trans-1,2-Dichloroethene	10.0	8.93		ug/L		89	74 - 130
Trichloroethene	10.0	8.97		ug/L		90	71 - 121

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-476776/4
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Vinyl chloride			10.0	11.1		ug/L		111	61 - 134		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*78*		*75 - 130*
4-Bromofluorobenzene (Surr)	*94*		*47 - 134*
Toluene-d8 (Surr)	*97*		*69 - 122*
Dibromofluoromethane (Surr)	*83*		*78 - 129*

Lab Sample ID: 190-25454-E-1 MS
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,1-Dichloroethene	1.0	U	10.0	6.81		ug/L		68	64 - 132		
cis-1,2-Dichloroethene	1.0	U	10.0	7.96		ug/L		80	68 - 121		
Tetrachloroethene	1.0	U	10.0	8.88		ug/L		89	52 - 129		
trans-1,2-Dichloroethene	1.0	U	10.0	7.48		ug/L		75	69 - 126		
Trichloroethene	1.0	U	10.0	7.78		ug/L		78	56 - 124		
Vinyl chloride	1.0	U	10.0	9.92		ug/L		99	49 - 136		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*75 - 130*
4-Bromofluorobenzene (Surr)	*97*		*47 - 134*
Toluene-d8 (Surr)	*95*		*69 - 122*
Dibromofluoromethane (Surr)	*83*		*78 - 129*

Lab Sample ID: 190-25454-F-1 MSD
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	6.82		ug/L		68	64 - 132	0	35
cis-1,2-Dichloroethene	1.0	U	10.0	8.09		ug/L		81	68 - 121	2	35
Tetrachloroethene	1.0	U	10.0	8.78		ug/L		88	52 - 129	1	35
trans-1,2-Dichloroethene	1.0	U	10.0	7.87		ug/L		79	69 - 126	5	35
Trichloroethene	1.0	U	10.0	8.10		ug/L		81	56 - 124	4	35
Vinyl chloride	1.0	U	10.0	10.4		ug/L		104	49 - 136	4	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*95*		*69 - 122*
Dibromofluoromethane (Surr)	*86*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473720/5
Matrix: Water
Analysis Batch: 473720

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/19/21 11:08	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/19/21 11:08*	*1*

Lab Sample ID: LCS 240-473720/4
Matrix: Water
Analysis Batch: 473720

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	9.95		ug/L		100	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144515-J-3 MS
Matrix: Water
Analysis Batch: 473720

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	11.0		ug/L		110	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144515-J-3 MSD
Matrix: Water
Analysis Batch: 473720

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.6		ug/L		106	46 - 170	3	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*

GC/MS VOA

Analysis Batch: 473720

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144505-2	MW-177S_021121	Total/NA	Water	8260B SIM	
MB 240-473720/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-473720/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144515-J-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144515-J-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 473958

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144505-2	MW-177S_021121	Total/NA	Water	8260B	
MB 240-473958/7	Method Blank	Total/NA	Water	8260B	
LCS 240-473958/4	Lab Control Sample	Total/NA	Water	8260B	
240-144518-G-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	
240-144518-H-2 MS	Matrix Spike	Total/NA	Water	8260B	

Analysis Batch: 476776

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144505-1	TRIP BLANK	Total/NA	Water	8260B	
MB 240-476776/7	Method Blank	Total/NA	Water	8260B	
LCS 240-476776/4	Lab Control Sample	Total/NA	Water	8260B	
190-25454-E-1 MS	Matrix Spike	Total/NA	Water	8260B	
190-25454-F-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144505-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144505-1

Date Collected: 02/11/21 00:00

Matrix: Water

Date Received: 02/13/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	476776	03/15/21 17:21	LRW	TAL CAN

Client Sample ID: MW-177S_021121

Lab Sample ID: 240-144505-2

Date Collected: 02/11/21 11:01

Matrix: Water

Date Received: 02/13/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473958	02/22/21 21:11	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	473720	02/19/21 12:24	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144505-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

TestAmerica MICHIGAN 190

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No: / of 1 COCs
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day	For lab use only: Walk-in client; Lab sampling; Job/SDG No:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/11/21			X						1							X	X	X	X	X	X	X	1 trip blank
MW-1975-021121	02/11/21	11:01		X						6					N	G	X	X	X	X	X	X	X	3 VOA's Method 8260B 3 VOA's Method 8260 SIM

240-144505 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	02/11/21 1745	Novi cold storage	Arcadis	02/11/21 1746
Julia McClafferty	Arcadis	2/11/2021	Amanda Battershell	ETA	2/12/21 10:05
Amanda Battershell	ETA	2/12/21 1101	Received in Laboratory by:	Company:	Date/Time:
				ETA	2-13-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 144505**
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Ryan C

Cooler Received on 2-13-21 Opened on 2-13-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 59072	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

March 26, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144505-1
Sample date: 2021-02-11
Report received by CADENA: 2021-03-26
Initial Data Verification completed by CADENA: 2021-03-26
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

HTQ - GCMS VOC sample TRIP BLANK analysis was performed outside of reference holding time due to an initial sample mix-up so all associated results should be considered to be estimated and qualified with UJ flags if non-detect.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Qualified Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144505-1

Sample Name: TRIP BLANK
Lab Sample ID: 2401445051
Sample Date: 2/11/2021

Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC					
OSW-8260B					
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	UJ
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	UJ
Tetrachloroethene	127-18-4	ND	1.0	ug/l	UJ
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	UJ
Trichloroethene	79-01-6	ND	1.0	ug/l	UJ
Vinyl chloride	75-01-4	ND	1.0	ug/l	UJ

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144505-1

		Sample Name:	TRIP BLANK				MW-177S_021121			
		Lab Sample ID:	2401445051				2401445052			
		Sample Date:	2/11/2021				2/11/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

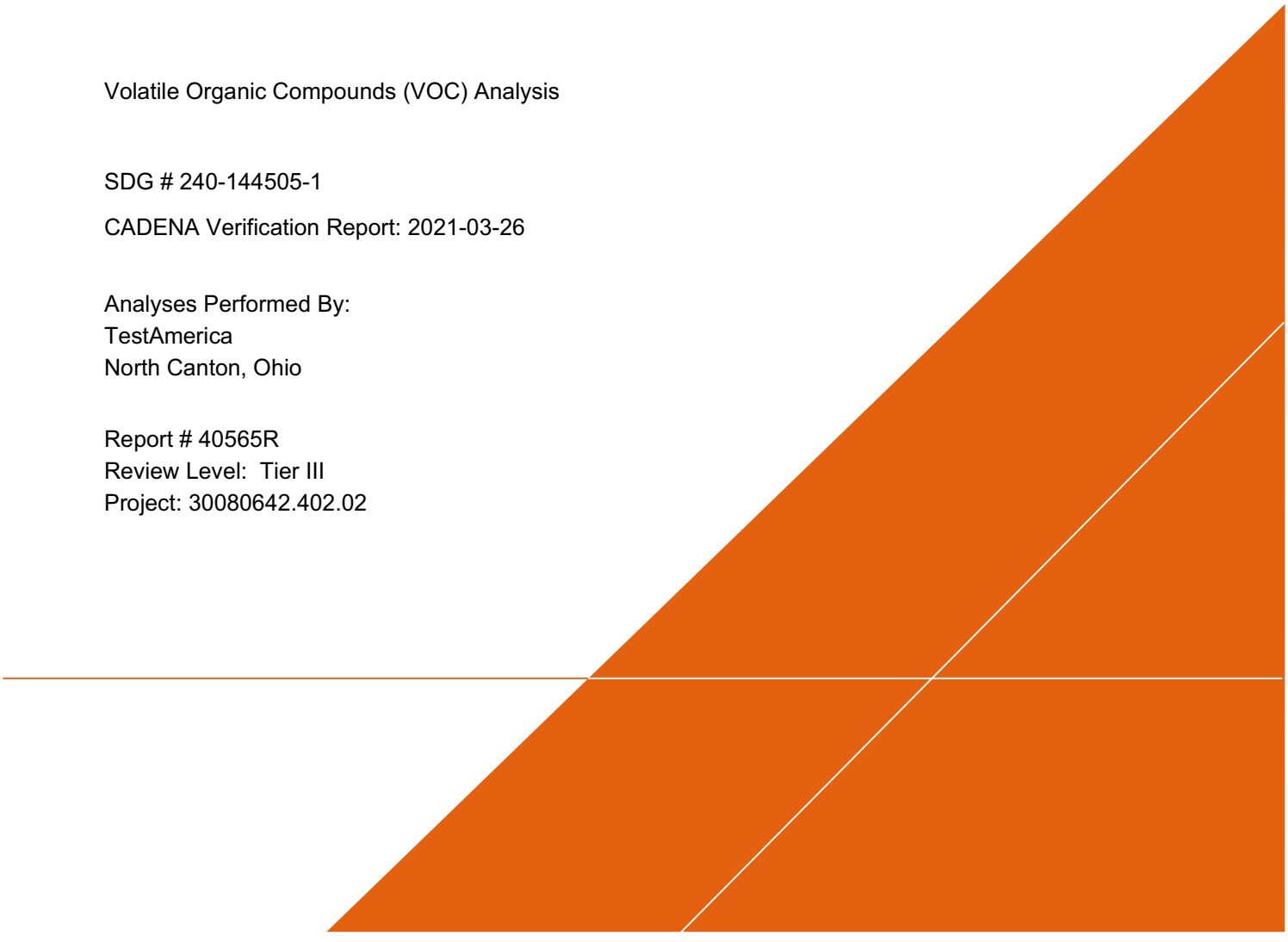
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144505-1

CADENA Verification Report: 2021-03-26

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40565R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144505-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144505-1	Water	02/11/2021		X	
MW-177S_021121	240-144505-2	Water	02/11/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

The analyses that exceeded the holding are presented in the following table.

Sample ID	Holding Time	Criteria
TRIP BLANK	32 days	14 days from collection to analysis

Sample results associated with samples mentioned in the table above, analyzed by analytical method SW-846 8260B were qualified, as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

DATA REVIEW

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X	X		
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

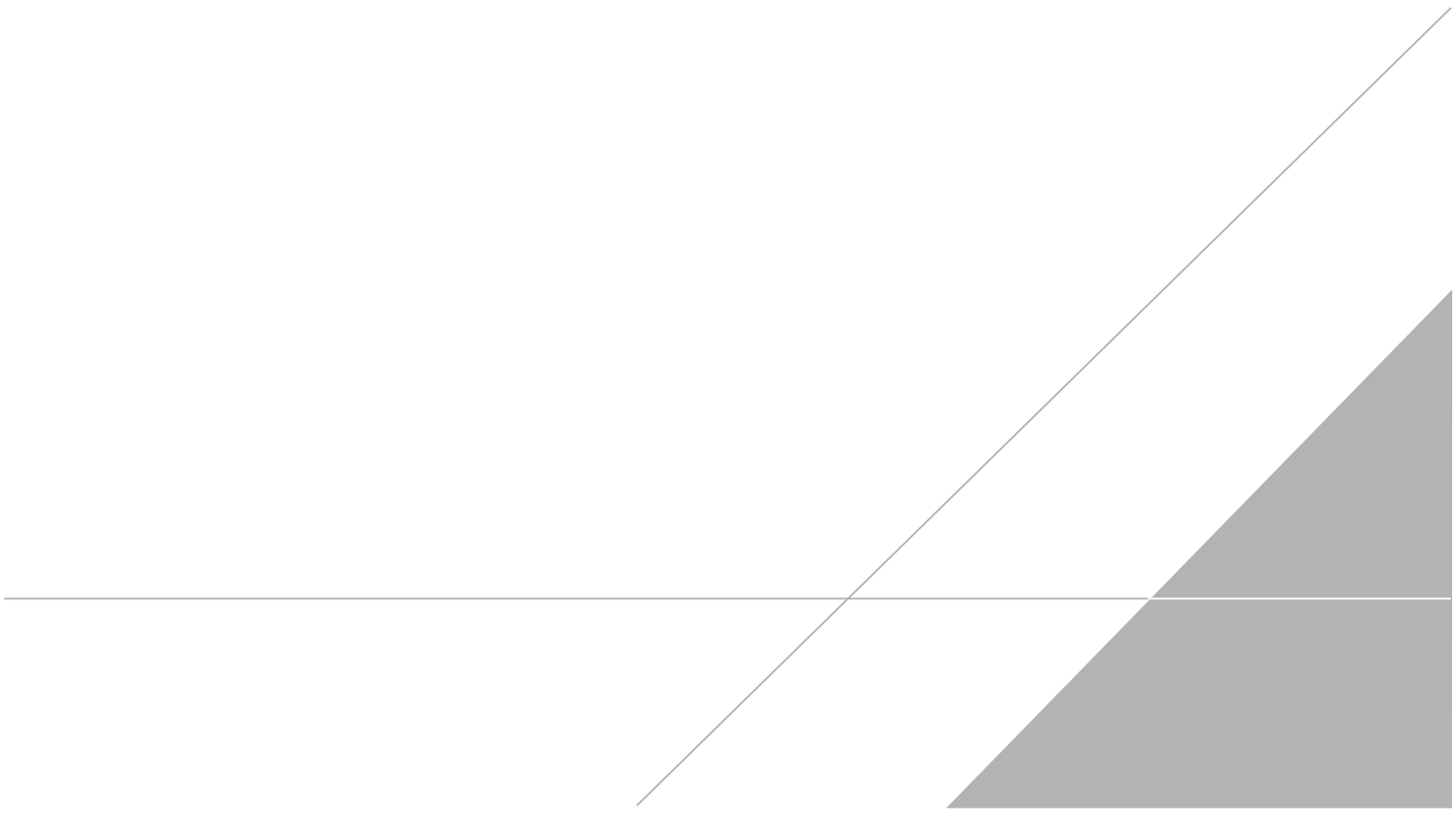
DATE: March 30, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 30, 2021

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



Chain of Custody Record

TestAmerica MICHIGAN 190

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: 10 day (3 weeks / 2 weeks / 1 week / 2 days / 1 day)		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ace/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/11/21			X						1							X	X	X	X	X	X	X	1 trip blank
MW-1975-021121	02/11/21	11:01		X						6					N	G	X	X	X	X	X	X	X	3 VOA's Method 8260B 3 VOA's Method 8260 SIM

240-144505 Chain of Custody

Possible Hazard Identification: Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / Disposal By Lab / Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	02 2/11/21 1745	Novi cold Storage	Arcadis	2/11/21 1746
Julia McClafferty	Arcadis	2/11/2021	Amanda Battershell	ETA	2/12/21 10:05
Amanda Battershell	ETA	2/12/21 1101	Received in Laboratory by:	Company:	Date/Time:
				ETA	2-13-21 800

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144505-1

Date Collected: 02/11/21 00:00
Matrix: Water
Date Received: 02/13/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
~~1,1-Dichloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.19~~	~~ug/L~~			~~03/15/21 17:21~~	R 1
~~cis-1,2-Dichloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.16~~	~~ug/L~~			~~03/15/21 17:21~~	R 1
~~Tetrachloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.15~~	~~ug/L~~			~~03/15/21 17:21~~	R 1
~~trans-1,2-Dichloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.19~~	~~ug/L~~			~~03/15/21 17:21~~	R 1
~~Trichloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.10~~	~~ug/L~~			~~03/15/21 17:21~~	R 1
~~Vinyl chloride~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.20~~	~~ug/L~~			~~03/15/21 17:21~~	R 1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*75 - 130*		*03/15/21 17:21*	*1*
4-Bromofluorobenzene (Surr)	*94*		*47 - 134*		*03/15/21 17:21*	*1*
Toluene-d8 (Surr)	*97*		*69 - 122*		*03/15/21 17:21*	*1*
Dibromofluoromethane (Surr)	*85*		*78 - 129*		*03/15/21 17:21*	*1*

Client Sample ID: MW-177S_021121
Lab Sample ID: 240-144505-2

Date Collected: 02/11/21 11:01
Matrix: Water
Date Received: 02/13/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/19/21 12:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/19/21 12:24*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 21:11	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 21:11	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 21:11	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 21:11	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 21:11	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/22/21 21:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*02/22/21 21:11*	*1*
4-Bromofluorobenzene (Surr)	*63*		*47 - 134*		*02/22/21 21:11*	*1*
Toluene-d8 (Surr)	*75*		*69 - 122*		*02/22/21 21:11*	*1*
Dibromofluoromethane (Surr)	*118*		*78 - 129*		*02/22/21 21:11*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144506-1
Client Project/Site: Ford LTP - Off Site
Revision: 1

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/26/2021 9:08:36 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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Visit us at:
www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144506-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144506-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144506-1

Comments
No additional comments.

Revision
The report being provided is a revision of the original report sent on 2/25/2021. The report (revision 1) is being revised due to: Samples mislabeled during unpacking - revised to correct data..

Receipt
The samples were received on 2/13/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.6° C.

GC/MS VOA
Method 8260B: The following sample was analyzed outside of analytical holding time due to mis-labeled vial: TRIP BLANK (240-144506-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144506-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144506-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144506-1	TRIP BLANK	Water	02/11/21 00:00	02/13/21 08:00	
240-144506-2	MW-184S_021121	Water	02/11/21 13:06	02/13/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144506-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144506-1

No Detections.

Client Sample ID: MW-184S_021121 — Lab Sample ID: 240-144506-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144506-1

Client Sample ID: TRIP BLANK
Date Collected: 02/11/21 00:00
Date Received: 02/13/21 08:00

Lab Sample ID: 240-144506-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U H	1.0	0.19	ug/L			03/15/21 17:45	1
cis-1,2-Dichloroethene	1.0	U H	1.0	0.16	ug/L			03/15/21 17:45	1
Tetrachloroethene	1.0	U H	1.0	0.15	ug/L			03/15/21 17:45	1
trans-1,2-Dichloroethene	1.0	U H	1.0	0.19	ug/L			03/15/21 17:45	1
Trichloroethene	1.0	U H	1.0	0.10	ug/L			03/15/21 17:45	1
Vinyl chloride	1.0	U H	1.0	0.20	ug/L			03/15/21 17:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*75 - 130*		*03/15/21 17:45*	*1*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*		*03/15/21 17:45*	*1*
Toluene-d8 (Surr)	*95*		*69 - 122*		*03/15/21 17:45*	*1*
Dibromofluoromethane (Surr)	*87*		*78 - 129*		*03/15/21 17:45*	*1*

Client Sample ID: MW-184S_021121
Date Collected: 02/11/21 13:06
Date Received: 02/13/21 08:00

Lab Sample ID: 240-144506-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 22:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/18/21 22:08*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 21:35	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 21:35	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 21:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 21:35	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 21:35	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/22/21 21:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*111*		*75 - 130*		*02/22/21 21:35*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*02/22/21 21:35*	*1*
Toluene-d8 (Surr)	*78*		*69 - 122*		*02/22/21 21:35*	*1*
Dibromofluoromethane (Surr)	*122*		*78 - 129*		*02/22/21 21:35*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144506-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
190-25454-E-1 MS	Matrix Spike	79	97	95	83
190-25454-F-1 MSD	Matrix Spike Duplicate	84	95	95	86
240-144506-1	TRIP BLANK	82	91	95	87
240-144506-2	MW-184S_021121	111	65	78	122
240-144518-G-2 MSD	Matrix Spike Duplicate	80	87	87	96
240-144518-H-2 MS	Matrix Spike	88	96	91	95
LCS 240-473958/4	Lab Control Sample	91	90	88	95
LCS 240-476776/4	Lab Control Sample	78	94	97	83
MB 240-473958/7	Method Blank	112	68	79	114
MB 240-476776/7	Method Blank	80	91	98	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144425-C-2 MS	Matrix Spike	82
240-144425-C-2 MSD	Matrix Spike Duplicate	81
240-144506-2	MW-184S_021121	80
LCS 240-473604/4	Lab Control Sample	81
MB 240-473604/5	Method Blank	80

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473958/7
Matrix: Water
Analysis Batch: 473958

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 16:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 16:24	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 16:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 16:24	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 16:24	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/22/21 16:24	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*75 - 130*		*02/22/21 16:24*	*1*
4-Bromofluorobenzene (Surr)	*68*		*47 - 134*		*02/22/21 16:24*	*1*
Toluene-d8 (Surr)	*79*		*69 - 122*		*02/22/21 16:24*	*1*
Dibromofluoromethane (Surr)	*114*		*78 - 129*		*02/22/21 16:24*	*1*

Lab Sample ID: LCS 240-473958/4
Matrix: Water
Analysis Batch: 473958

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.9		ug/L		109	73 - 129
cis-1,2-Dichloroethene	10.0	10.0		ug/L		100	75 - 124
Tetrachloroethene	10.0	12.2		ug/L		122	70 - 125
trans-1,2-Dichloroethene	10.0	11.0		ug/L		110	74 - 130
Trichloroethene	10.0	10.1		ug/L		101	71 - 121
Vinyl chloride	10.0	9.31		ug/L		93	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*91*		*75 - 130*
4-Bromofluorobenzene (Surr)	*90*		*47 - 134*
Toluene-d8 (Surr)	*88*		*69 - 122*
Dibromofluoromethane (Surr)	*95*		*78 - 129*

Lab Sample ID: 240-144518-G-2 MSD
Matrix: Water
Analysis Batch: 473958

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.98		ug/L		100	64 - 132	3	35
cis-1,2-Dichloroethene	1.0	U	10.0	10.1		ug/L		101	68 - 121	7	35
Tetrachloroethene	1.0	U	10.0	10.7		ug/L		107	52 - 129	2	35
trans-1,2-Dichloroethene	1.0	U	10.0	10.2		ug/L		102	69 - 126	2	35
Trichloroethene	1.0	U	10.0	9.58		ug/L		96	56 - 124	1	35
Vinyl chloride	1.0	U	10.0	9.46		ug/L		95	49 - 136	3	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*80*		*75 - 130*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*
Toluene-d8 (Surr)	*87*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144518-G-2 MSD
Matrix: Water
Analysis Batch: 473958

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*96*		*78 - 129*

Lab Sample ID: 240-144518-H-2 MS
Matrix: Water
Analysis Batch: 473958

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.71		ug/L		97	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	9.40		ug/L		94	68 - 121
Tetrachloroethene	1.0	U	10.0	11.0		ug/L		110	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	69 - 126
Trichloroethene	1.0	U	10.0	9.67		ug/L		97	56 - 124
Vinyl chloride	1.0	U	10.0	9.16		ug/L		92	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 130*
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*
Toluene-d8 (Surr)	*91*		*69 - 122*
Dibromofluoromethane (Surr)	*95*		*78 - 129*

Lab Sample ID: MB 240-476776/7
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/15/21 15:40	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/15/21 15:40	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/15/21 15:40	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/15/21 15:40	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/15/21 15:40	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/15/21 15:40	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*75 - 130*		*03/15/21 15:40*	*1*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*		*03/15/21 15:40*	*1*
Toluene-d8 (Surr)	*98*		*69 - 122*		*03/15/21 15:40*	*1*
Dibromofluoromethane (Surr)	*81*		*78 - 129*		*03/15/21 15:40*	*1*

Lab Sample ID: LCS 240-476776/4
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.48		ug/L		85	73 - 129
cis-1,2-Dichloroethene	10.0	9.17		ug/L		92	75 - 124
Tetrachloroethene	10.0	10.2		ug/L		102	70 - 125
trans-1,2-Dichloroethene	10.0	8.93		ug/L		89	74 - 130
Trichloroethene	10.0	8.97		ug/L		90	71 - 121

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-476776/4
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Vinyl chloride			10.0	11.1		ug/L		111	61 - 134		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*78*		*75 - 130*
4-Bromofluorobenzene (Surr)	*94*		*47 - 134*
Toluene-d8 (Surr)	*97*		*69 - 122*
Dibromofluoromethane (Surr)	*83*		*78 - 129*

Lab Sample ID: 190-25454-E-1 MS
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,1-Dichloroethene	1.0	U	10.0	6.81		ug/L		68	64 - 132		
cis-1,2-Dichloroethene	1.0	U	10.0	7.96		ug/L		80	68 - 121		
Tetrachloroethene	1.0	U	10.0	8.88		ug/L		89	52 - 129		
trans-1,2-Dichloroethene	1.0	U	10.0	7.48		ug/L		75	69 - 126		
Trichloroethene	1.0	U	10.0	7.78		ug/L		78	56 - 124		
Vinyl chloride	1.0	U	10.0	9.92		ug/L		99	49 - 136		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*75 - 130*
4-Bromofluorobenzene (Surr)	*97*		*47 - 134*
Toluene-d8 (Surr)	*95*		*69 - 122*
Dibromofluoromethane (Surr)	*83*		*78 - 129*

Lab Sample ID: 190-25454-F-1 MSD
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	6.82		ug/L		68	64 - 132	0	35
cis-1,2-Dichloroethene	1.0	U	10.0	8.09		ug/L		81	68 - 121	2	35
Tetrachloroethene	1.0	U	10.0	8.78		ug/L		88	52 - 129	1	35
trans-1,2-Dichloroethene	1.0	U	10.0	7.87		ug/L		79	69 - 126	5	35
Trichloroethene	1.0	U	10.0	8.10		ug/L		81	56 - 124	4	35
Vinyl chloride	1.0	U	10.0	10.4		ug/L		104	49 - 136	4	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*95*		*69 - 122*
Dibromofluoromethane (Surr)	*86*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473604/5
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 12:27	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/18/21 12:27*	*1*

Lab Sample ID: LCS 240-473604/4
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.5		ug/L		105	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

Lab Sample ID: 240-144425-C-2 MS
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	11.1		ug/L		111	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144425-C-2 MSD
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.7		ug/L		107	46 - 170	3	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

GC/MS VOA

Analysis Batch: 473604

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144506-2	MW-184S_021121	Total/NA	Water	8260B SIM	
MB 240-473604/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-473604/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144425-C-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144425-C-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 473958

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144506-2	MW-184S_021121	Total/NA	Water	8260B	
MB 240-473958/7	Method Blank	Total/NA	Water	8260B	
LCS 240-473958/4	Lab Control Sample	Total/NA	Water	8260B	
240-144518-G-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	
240-144518-H-2 MS	Matrix Spike	Total/NA	Water	8260B	

Analysis Batch: 476776

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144506-1	TRIP BLANK	Total/NA	Water	8260B	
MB 240-476776/7	Method Blank	Total/NA	Water	8260B	
LCS 240-476776/4	Lab Control Sample	Total/NA	Water	8260B	
190-25454-E-1 MS	Matrix Spike	Total/NA	Water	8260B	
190-25454-F-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144506-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144506-1

Date Collected: 02/11/21 00:00
Matrix: Water
Date Received: 02/13/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	476776	03/15/21 17:45	LRW	TAL CAN

Client Sample ID: MW-184S_021121

Lab Sample ID: 240-144506-2

Date Collected: 02/11/21 13:06
Matrix: Water
Date Received: 02/13/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473958	02/22/21 21:35	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	473604	02/18/21 22:08	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144506-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

MICHIGAN 190 TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT (if different from below)		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:	10 day ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Lab sampling
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H_2SO_4	HNO_3	HCl	NaOH	$ZnAc/NaOH$	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/11/21			X						1							X	X	X	X	X	X	X	1 trip blank
MW-1845_021121	02/11/21	13:06		X						6					N	G	X	X	X	X	X	X	X	3 vials Method 8260B 3 vials Method 8260Sim

240-144506 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalla@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	02/11/21 1745	Novi cold storage	Arcadis	02/11/21 1746
Julia McClafferty	Arcadis	2/12/2021	Amanda Battershell	ETA	2/12/21 10:05
Amanda Battershell	ETA	2/12/21 11:01	Received in Laboratory by:	Company: ETA	Date/Time: 2-13-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 144506
Canton Facility

Client Arcadis Site Name

Cooler unpacked by: Ryan C

Cooler Received on 2-13-21 Opened on 2-13-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.5 °C Corrected Cooler Temp. 1.6 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC907861
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 59072	Yes	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

March 26, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144506-1
Sample date: 2021-02-11
Report received by CADENA: 2021-03-26
Initial Data Verification completed by CADENA: 2021-03-26
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

HTQ - GCMS VOC sample TRIP BLANK analysis was performed outside of reference holding time due to an initial sample mix-up so all associated results should be considered to be estimated and qualified with UJ flags if non-detect.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Qualified Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144506-1

Sample Name: TRIP BLANK
Lab Sample ID: 2401445061
Sample Date: 2/11/2021

Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC					
OSW-8260B					
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	UJ
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	UJ
Tetrachloroethene	127-18-4	ND	1.0	ug/l	UJ
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	UJ
Trichloroethene	79-01-6	ND	1.0	ug/l	UJ
Vinyl chloride	75-01-4	ND	1.0	ug/l	UJ

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144506-1

		Sample Name:	TRIP BLANK				MW-184S_021121			
		Lab Sample ID:	2401445061				2401445062			
		Sample Date:	2/11/2021				2/11/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

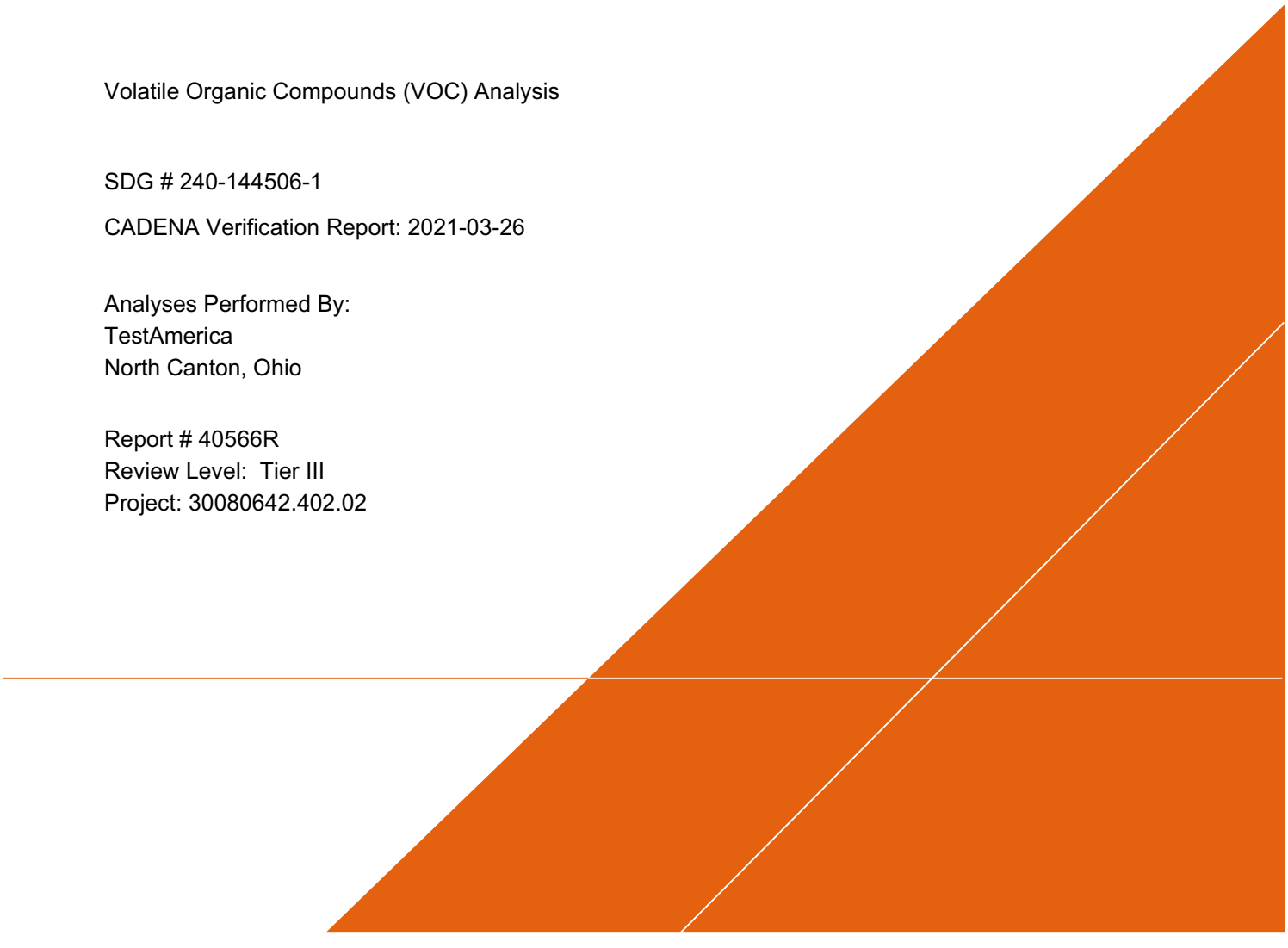
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144506-1

CADENA Verification Report: 2021-03-26

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40566R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144506-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144506-1	Water	02/11/2021		X	
MW-184S_021121	240-144506-2	Water	02/11/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

The analyses that exceeded the holding are presented in the following table.

Sample ID	Holding Time	Criteria
TRIP BLANK	32 days	14 days from collection to analysis

Sample results associated with samples mentioned in the table above, analyzed by analytical method SW-846 8260B were qualified, as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

DATA REVIEW

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X	X		
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

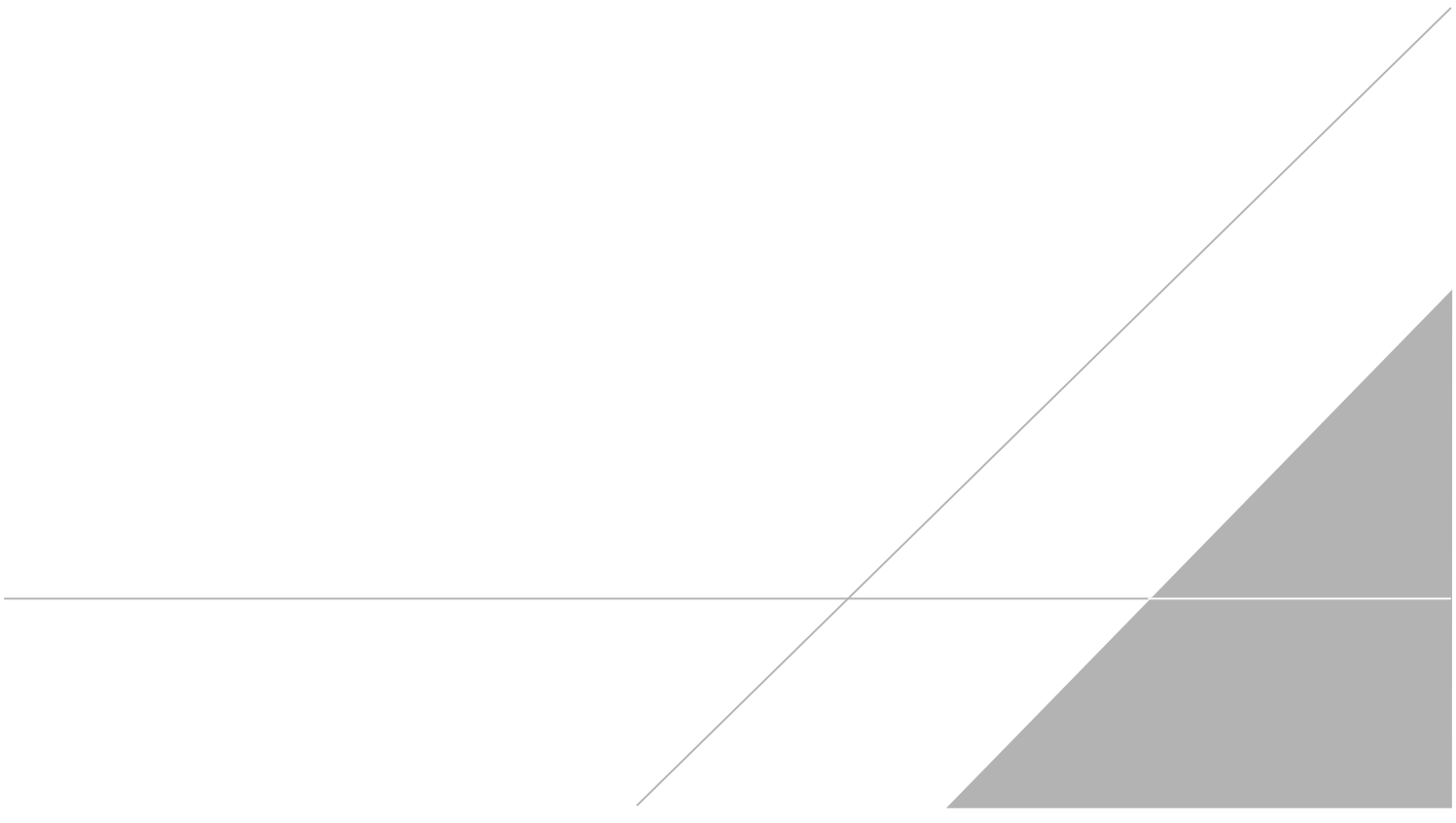
DATE: March 30, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 30, 2021

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



Chain of Custody Record

MICHIGAN TestAmerica 190

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	/ of / COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Gary Schafer	TAT (if different from below)		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:	10 day ✓ 3 weeks / 2 weeks / 1 week / 2 days / 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/11/21			X						1							X	X	X	X	X	X	X	1 trip blank
MW-1845_021121	02/11/21	13:06		X						6					N	G	X	X	X	X	X	X	X	3 VOAs Method 8260B 3 VOAs Method 8260Sim

240-144506 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / ✓ Disposal By Lab / Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	02/11/21 1745	Novi cold storage	Arcadis	02/11/21 1746
Julia McClafferty	Arcadis	2/12/2021	Amanda Battershell	ETA	2/12/21 10:05
Amanda Battershell	ETA	2/12/21 11:01	Received in Laboratory by:	Company:	Date/Time: 2-13-21 800

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144506-1

Date Collected: 02/11/21 00:00
Matrix: Water
Date Received: 02/13/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
~~1,1-Dichloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.19~~	~~ug/L~~			~~03/15/21 17:45~~	R	1
~~cis-1,2-Dichloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.16~~	~~ug/L~~			~~03/15/21 17:45~~	R	1
~~Tetrachloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.15~~	~~ug/L~~			~~03/15/21 17:45~~	R	1
~~trans-1,2-Dichloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.19~~	~~ug/L~~			~~03/15/21 17:45~~	R	1
~~Trichloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.10~~	~~ug/L~~			~~03/15/21 17:45~~	R	1
~~Vinyl chloride~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.20~~	~~ug/L~~			~~03/15/21 17:45~~	R	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*75 - 130*		*03/15/21 17:45*	*1*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*		*03/15/21 17:45*	*1*
Toluene-d8 (Surr)	*95*		*69 - 122*		*03/15/21 17:45*	*1*
Dibromofluoromethane (Surr)	*87*		*78 - 129*		*03/15/21 17:45*	*1*

Client Sample ID: MW-184S_021121
Lab Sample ID: 240-144506-2

Date Collected: 02/11/21 13:06
Matrix: Water
Date Received: 02/13/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 22:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/18/21 22:08*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 21:35	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 21:35	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 21:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 21:35	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 21:35	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/22/21 21:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*111*		*75 - 130*		*02/22/21 21:35*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*02/22/21 21:35*	*1*
Toluene-d8 (Surr)	*78*		*69 - 122*		*02/22/21 21:35*	*1*
Dibromofluoromethane (Surr)	*122*		*78 - 129*		*02/22/21 21:35*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144701-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/8/2021 10:53:39 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
Review your project results through TotalAccess
Have a Question? Ask The Expert
Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144701-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144701-1

Job ID: 240-144701-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144701-1

Comments
No additional comments.

Receipt
The samples were received on 2/20/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.7º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144701-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144701-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144701-1	TRIP BLANK	Water	02/18/21 00:00	02/20/21 08:00	
240-144701-2	MW-167S_021821	Water	02/18/21 11:32	02/20/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144701-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144701-1

No Detections.

Client Sample ID: MW-167S_021821 — Lab Sample ID: 240-144701-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144701-1

Client Sample ID: TRIP BLANK
Date Collected: 02/18/21 00:00
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144701-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 13:56	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 13:56	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 13:56	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 13:56	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 13:56	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 13:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*75 - 130*		*02/26/21 13:56*	*1*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*		*02/26/21 13:56*	*1*
Toluene-d8 (Surr)	*91*		*69 - 122*		*02/26/21 13:56*	*1*
Dibromofluoromethane (Surr)	*102*		*78 - 129*		*02/26/21 13:56*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144701-1

Client Sample ID: MW-167S_021821
Date Collected: 02/18/21 11:32
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144701-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 17:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/25/21 17:45*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 14:20	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 14:20	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 14:20	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 14:20	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 14:20	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 14:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*75 - 130*		*02/26/21 14:20*	*1*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*		*02/26/21 14:20*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*02/26/21 14:20*	*1*
Dibromofluoromethane (Surr)	*102*		*78 - 129*		*02/26/21 14:20*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144701-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144701-1	TRIP BLANK	102	103	91	102
240-144701-2	MW-167S_021821	102	103	92	102
240-144712-E-3 MS	Matrix Spike	92	103	94	93
240-144712-H-3 MSD	Matrix Spike Duplicate	93	103	94	94
LCS 240-474649/5	Lab Control Sample	93	103	93	94
MB 240-474649/8	Method Blank	101	103	91	103

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144568-J-3 MS	Matrix Spike	79
240-144568-J-3 MSD	Matrix Spike Duplicate	83
240-144701-2	MW-167S_021821	83
LCS 240-474490/4	Lab Control Sample	79
MB 240-474490/5	Method Blank	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474649/8
Matrix: Water
Analysis Batch: 474649

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 12:15	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 12:15	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 12:15	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 12:15	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 12:15	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 12:15	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*02/26/21 12:15*	*1*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*		*02/26/21 12:15*	*1*
Toluene-d8 (Surr)	*91*		*69 - 122*		*02/26/21 12:15*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*02/26/21 12:15*	*1*

Lab Sample ID: LCS 240-474649/5
Matrix: Water
Analysis Batch: 474649

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	20.0	20.0		ug/L		100	73 - 129
cis-1,2-Dichloroethene	20.0	19.8		ug/L		99	75 - 124
Tetrachloroethene	20.0	19.2		ug/L		96	70 - 125
trans-1,2-Dichloroethene	20.0	19.5		ug/L		97	74 - 130
Trichloroethene	20.0	18.2		ug/L		91	71 - 121
Vinyl chloride	20.0	23.3		ug/L		116	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*94*		*78 - 129*

Lab Sample ID: 240-144712-E-3 MS
Matrix: Water
Analysis Batch: 474649

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	20.0	19.7		ug/L		99	64 - 132
cis-1,2-Dichloroethene	1.0	U	20.0	20.1		ug/L		100	68 - 121
Tetrachloroethene	1.0	U	20.0	19.0		ug/L		95	52 - 129
trans-1,2-Dichloroethene	1.0	U	20.0	19.7		ug/L		98	69 - 126
Trichloroethene	1.0	U	20.0	17.6		ug/L		88	56 - 124
Vinyl chloride	1.0	U	20.0	25.7		ug/L		129	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*
Toluene-d8 (Surr)	*94*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144712-E-3 MS
Matrix: Water
Analysis Batch: 474649

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*93*		*78 - 129*

Lab Sample ID: 240-144712-H-3 MSD
Matrix: Water
Analysis Batch: 474649

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	20.0	20.7		ug/L		104	64 - 132	5	35
cis-1,2-Dichloroethene	1.0	U	20.0	21.0		ug/L		105	68 - 121	4	35
Tetrachloroethene	1.0	U	20.0	19.5		ug/L		97	52 - 129	2	35
trans-1,2-Dichloroethene	1.0	U	20.0	20.2		ug/L		101	69 - 126	3	35
Trichloroethene	1.0	U	20.0	19.0		ug/L		95	56 - 124	8	35
Vinyl chloride	1.0	U	20.0	25.1		ug/L		125	49 - 136	3	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*
Toluene-d8 (Surr)	*94*		*69 - 122*
Dibromofluoromethane (Surr)	*94*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474490/5
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 12:43	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/25/21 12:43*	*1*

Lab Sample ID: LCS 240-474490/4
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.7		ug/L		107	80 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*

Lab Sample ID: 240-144568-J-3 MS
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	10.2		ug/L		102	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*

Lab Sample ID: 240-144568-J-3 MSD
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.2		ug/L		102	46 - 170	0	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144701-1

GC/MS VOA

Analysis Batch: 474490

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144701-2	MW-167S_021821	Total/NA	Water	8260B SIM	
MB 240-474490/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474490/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144568-J-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144568-J-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474649

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144701-1	TRIP BLANK	Total/NA	Water	8260B	
240-144701-2	MW-167S_021821	Total/NA	Water	8260B	
MB 240-474649/8	Method Blank	Total/NA	Water	8260B	
LCS 240-474649/5	Lab Control Sample	Total/NA	Water	8260B	
240-144712-E-3 MS	Matrix Spike	Total/NA	Water	8260B	
240-144712-H-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144701-1

Client Sample ID: TRIP BLANK
Date Collected: 02/18/21 00:00
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144701-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474649	02/26/21 13:56	HMB	TAL CAN

Client Sample ID: MW-167S_021821
Date Collected: 02/18/21 11:32
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144701-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474649	02/26/21 14:20	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		1	474490	02/25/21 17:45	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144701-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

MICHIGAN 190 — TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Kristoffer Hinskey	TAT if different from below: 10 day; ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client:
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1675_221821	2/18/21	1132		6						6					N	G	X	X	X	X	X	X	X	3VOAs for 8260 B 3VOAs for 8260 B SIM

240-144701 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Kristoffer Hinskey	Arcadis	2/18/21 1700	Novi Cold Storage	Arcadis	2/18/21 1700
Kristoffer Hinskey	Arcadis	2/19/21 10:11	Amanda Battershell	ETA	2/19/21 10:11
Amanda Battershell	ETA	2/19/21 14:33	Received in Laboratory by:	TA	2-20-21 840

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 144701
Canton Facility

Client Arcadis Site Name

Cooler Received on 2-20-21 Opened on 2-20-21

Cooler unpacked by:

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.6 °C Corrected Cooler Temp. 1.7 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC907861
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #	Yes	No
17. Was a LL Hg or Me Hg trip blank present?	Yes	No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

March 08, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144701-1
Sample date: 2021-02-18
Report received by CADENA: 2021-03-08
Initial Data Verification completed by CADENA: 2021-03-08
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144701-1

		Sample Name:	TRIP BLANK				MW-167S_021821			
		Lab Sample ID:	2401447011				2401447012			
		Sample Date:	2/18/2021				2/18/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

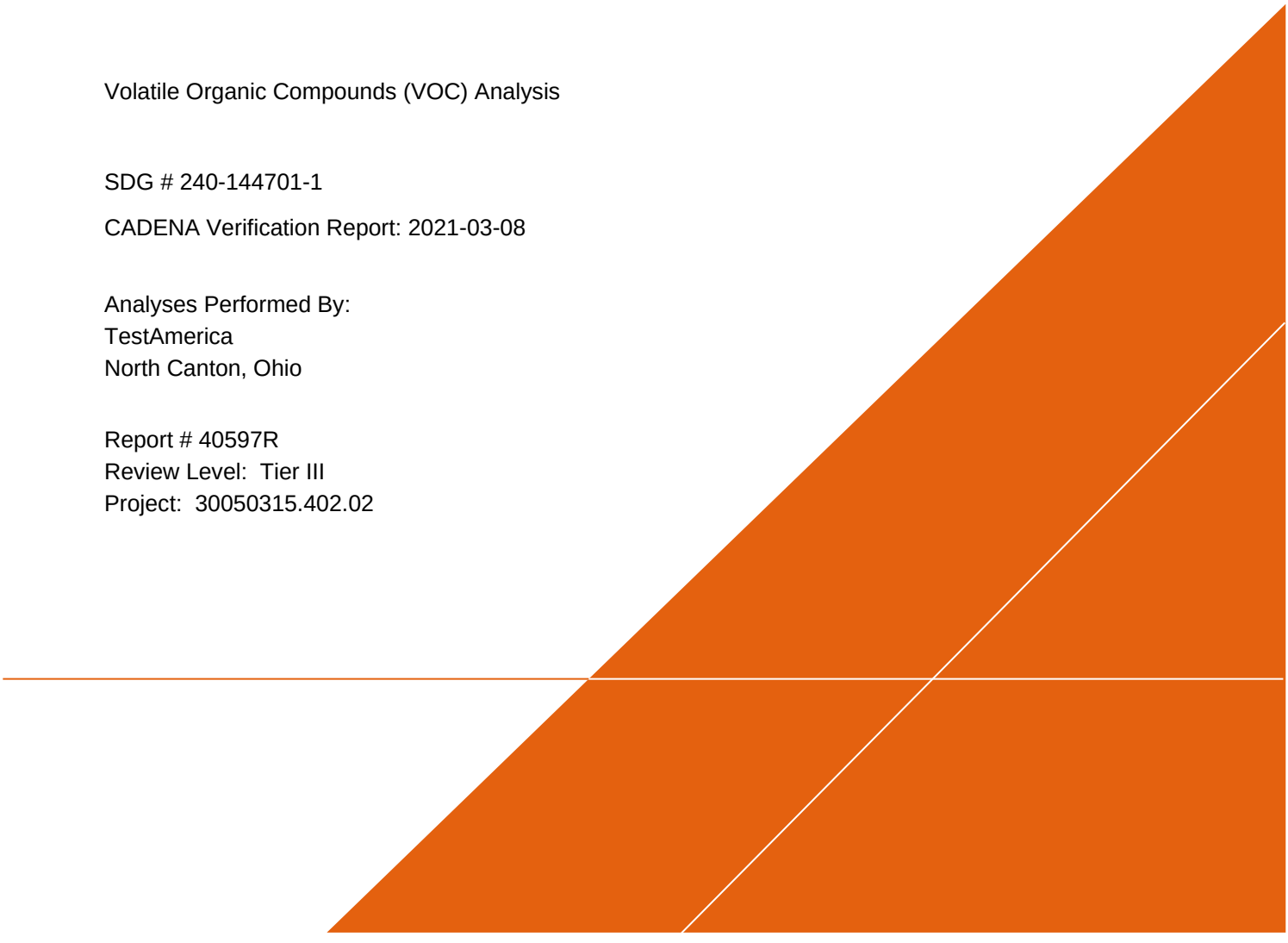
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144701-1

CADENA Verification Report: 2021-03-08

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40597R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144701-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144701-1	Water	02/18/2021		X	
MW-167S_021821	240-144701-2	Water	02/18/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

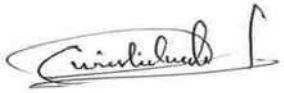
%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 17, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 18, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190 TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		of COCs
Phone: 248-994-2240	Sampler Name: Kara Donahue	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		For lab use only
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Walk-in client
Project Number: 30050315.402.04	Shipping/Tracking No:			Lab sampling
PO # 30050315.402.04				Job/SDG No:

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1675_021821	2/18/21	1132		G						G					N	G	X	X	X	X	X	X	X	3 VOAs for 8260 B 3 VOAs for 8260 B SIM

240-144701 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Kara Donahue	Arcadis	2/18/21 1700	Novi Cold Storage	Arcadis	2/18/21 1700
Kara Donahue	Arcadis	2/19/21 10:11	Amanda Battershell	ETA	2/19/21 10:11
Amanda Battershell	ETA	2/19/21 14:33	Received in Laboratory by:	Company: ETA	Date/Time: 2/20/21 840

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144701-1
Date Collected: 02/18/21 00:00
Matrix: Water
Date Received: 02/20/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 13:56	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 13:56	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 13:56	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 13:56	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 13:56	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 13:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*75 - 130*		*02/26/21 13:56*	*1*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*		*02/26/21 13:56*	*1*
Toluene-d8 (Surr)	*91*		*69 - 122*		*02/26/21 13:56*	*1*
Dibromofluoromethane (Surr)	*102*		*78 - 129*		*02/26/21 13:56*	*1*

Client Sample ID: MW-167S_021821
Lab Sample ID: 240-144701-2
Date Collected: 02/18/21 11:32
Matrix: Water
Date Received: 02/20/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 17:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/25/21 17:45*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 14:20	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 14:20	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 14:20	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 14:20	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 14:20	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 14:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*75 - 130*		*02/26/21 14:20*	*1*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*		*02/26/21 14:20*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*02/26/21 14:20*	*1*
Dibromofluoromethane (Surr)	*102*		*78 - 129*		*02/26/21 14:20*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144362-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
2/17/2021 10:31:09 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at:
www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144362-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144362-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144362-1

Comments
No additional comments.

Receipt
The samples were received on 2/11/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.2° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144362-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144362-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144362-1	TRIP BLANK	Water	02/09/21 00:00	02/11/21 08:00	
240-144362-2	MW-162S_020921	Water	02/09/21 16:45	02/11/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144362-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144362-1

No Detections.

Client Sample ID: MW-162S_020921 — Lab Sample ID: 240-144362-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144362-1

Client Sample ID: TRIP BLANK
Date Collected: 02/09/21 00:00
Date Received: 02/11/21 08:00

Lab Sample ID: 240-144362-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 16:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 16:07	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 16:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 16:07	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 16:07	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 16:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*		*02/15/21 16:07*	*1*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*		*02/15/21 16:07*	*1*
Toluene-d8 (Surr)	*99*		*69 - 122*		*02/15/21 16:07*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*02/15/21 16:07*	*1*

Client Sample ID: MW-162S_020921
Date Collected: 02/09/21 16:45
Date Received: 02/11/21 08:00

Lab Sample ID: 240-144362-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 17:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/12/21 17:06*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 16:29	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 16:29	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 16:29	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 16:29	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 16:29	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 16:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*02/15/21 16:29*	*1*
4-Bromofluorobenzene (Surr)	*90*		*47 - 134*		*02/15/21 16:29*	*1*
Toluene-d8 (Surr)	*102*		*69 - 122*		*02/15/21 16:29*	*1*
Dibromofluoromethane (Surr)	*102*		*78 - 129*		*02/15/21 16:29*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144362-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144277-B-2 MS	Matrix Spike	91	95	105	99
240-144277-B-2 MSD	Matrix Spike Duplicate	93	90	99	99
240-144362-1	TRIP BLANK	97	87	99	103
240-144362-2	MW-162S_020921	100	90	102	102
LCS 240-473047/4	Lab Control Sample	99	102	106	104
MB 240-473047/6	Method Blank	86	81	92	93

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144362-2	MW-162S_020921	82
240-144376-F-3 MS	Matrix Spike	83
240-144376-F-3 MSD	Matrix Spike Duplicate	82
LCS 240-472900/4	Lab Control Sample	82
MB 240-472900/5	Method Blank	82

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473047/6
Matrix: Water
Analysis Batch: 473047

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 10:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 10:57	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 10:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 10:57	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 10:57	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 10:57	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*		*02/15/21 10:57*	*1*
4-Bromofluorobenzene (Surr)	*81*		*47 - 134*		*02/15/21 10:57*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*02/15/21 10:57*	*1*
Dibromofluoromethane (Surr)	*93*		*78 - 129*		*02/15/21 10:57*	*1*

Lab Sample ID: LCS 240-473047/4
Matrix: Water
Analysis Batch: 473047

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	11.1		ug/L		111	73 - 129
cis-1,2-Dichloroethene	10.0	10.6		ug/L		106	75 - 124
Tetrachloroethene	10.0	11.4		ug/L		114	70 - 125
trans-1,2-Dichloroethene	10.0	10.4		ug/L		104	74 - 130
Trichloroethene	10.0	10.4		ug/L		104	71 - 121
Vinyl chloride	10.0	9.92		ug/L		99	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*99*		*75 - 130*
4-Bromofluorobenzene (Surr)	*102*		*47 - 134*
Toluene-d8 (Surr)	*106*		*69 - 122*
Dibromofluoromethane (Surr)	*104*		*78 - 129*

Lab Sample ID: 240-144277-B-2 MS
Matrix: Water
Analysis Batch: 473047

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	67	U	667	598		ug/L		90	64 - 132
cis-1,2-Dichloroethene	1500		667	2140		ug/L		102	68 - 121
Tetrachloroethene	56	J	667	634		ug/L		87	52 - 129
Trichloroethene	1100		667	1670		ug/L		91	56 - 124
Vinyl chloride	160		667	734		ug/L		86	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*91*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*105*		*69 - 122*
Dibromofluoromethane (Surr)	*99*		*78 - 129*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144277-B-2 MSD
Matrix: Water
Analysis Batch: 473047

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	67	U	667	668		ug/L		100	64 - 132	11	35
cis-1,2-Dichloroethene	1500		667	2220		ug/L		113	68 - 121	3	35
Tetrachloroethene	56	J	667	730		ug/L		101	52 - 129	14	35
Trichloroethene	1100		667	1740		ug/L		101	56 - 124	4	35
Vinyl chloride	160		667	774		ug/L		92	49 - 136	5	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*90*		*47 - 134*
Toluene-d8 (Surr)	*99*		*69 - 122*
Dibromofluoromethane (Surr)	*99*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-472900/5
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 12:29	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/12/21 12:29*	*1*

Lab Sample ID: LCS 240-472900/4
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.6		ug/L		106	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144376-F-3 MS
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	10.8		ug/L		108	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144376-F-3 MSD
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.8		ug/L		108	46 - 170	1	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

GC/MS VOA

Analysis Batch: 472900

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144362-2	MW-162S_020921	Total/NA	Water	8260B SIM	
MB 240-472900/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-472900/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144376-F-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144376-F-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 473047

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144362-1	TRIP BLANK	Total/NA	Water	8260B	
240-144362-2	MW-162S_020921	Total/NA	Water	8260B	
MB 240-473047/6	Method Blank	Total/NA	Water	8260B	
LCS 240-473047/4	Lab Control Sample	Total/NA	Water	8260B	
240-144277-B-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144277-B-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144362-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144362-1

Date Collected: 02/09/21 00:00

Matrix: Water

Date Received: 02/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473047	02/15/21 16:07	LEE	TAL CAN

Client Sample ID: MW-162S_020921

Lab Sample ID: 240-144362-2

Date Collected: 02/09/21 16:45

Matrix: Water

Date Received: 02/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473047	02/15/21 16:29	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	472900	02/12/21 17:06	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144362-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Andrew Bandt	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Acet/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK				1						1					N	G	X	X	X	X	X	X	X	Trip Blank
MW-1625-020921	2/9/21	1645		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260BSIM

240-144362 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: Andrew Bandt	Arcadis	2/9/21 1810	Received by: Novi Cold Storage	Arcadis	2/9/21 1810
Relinquished by: Julia McClafferty	Arcadis	2/10/2021	Received by: Miranda Battenhill	ETA	2/10/21 10:12
Relinquished by: Miranda Battenhill	ETA	2/10/21 1309	Received in Laboratory by:	ETA	2-11-21 800

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2/17/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 144362**
Canton Facility

Client Arcadis Site Name

Cooler Received on 2-11-21 Opened on 2-11-21

Cooler unpacked by: Matt Snyder

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # VA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2.1 °C Corrected Cooler Temp. 2.2 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?	Yes	No
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC907861
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # D117701E	Yes	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

February 17, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144362-1
Sample date: 2021-02-09
Report received by CADENA: 2021-02-17
Initial Data Verification completed by CADENA: 2021-02-17
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144362-1

		Sample Name:	TRIP BLANK				MW-162S_020921			
		Lab Sample ID:	2401443621				2401443622			
		Sample Date:	2/9/2021				2/9/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS Design & Consultancy for natural and built assets

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

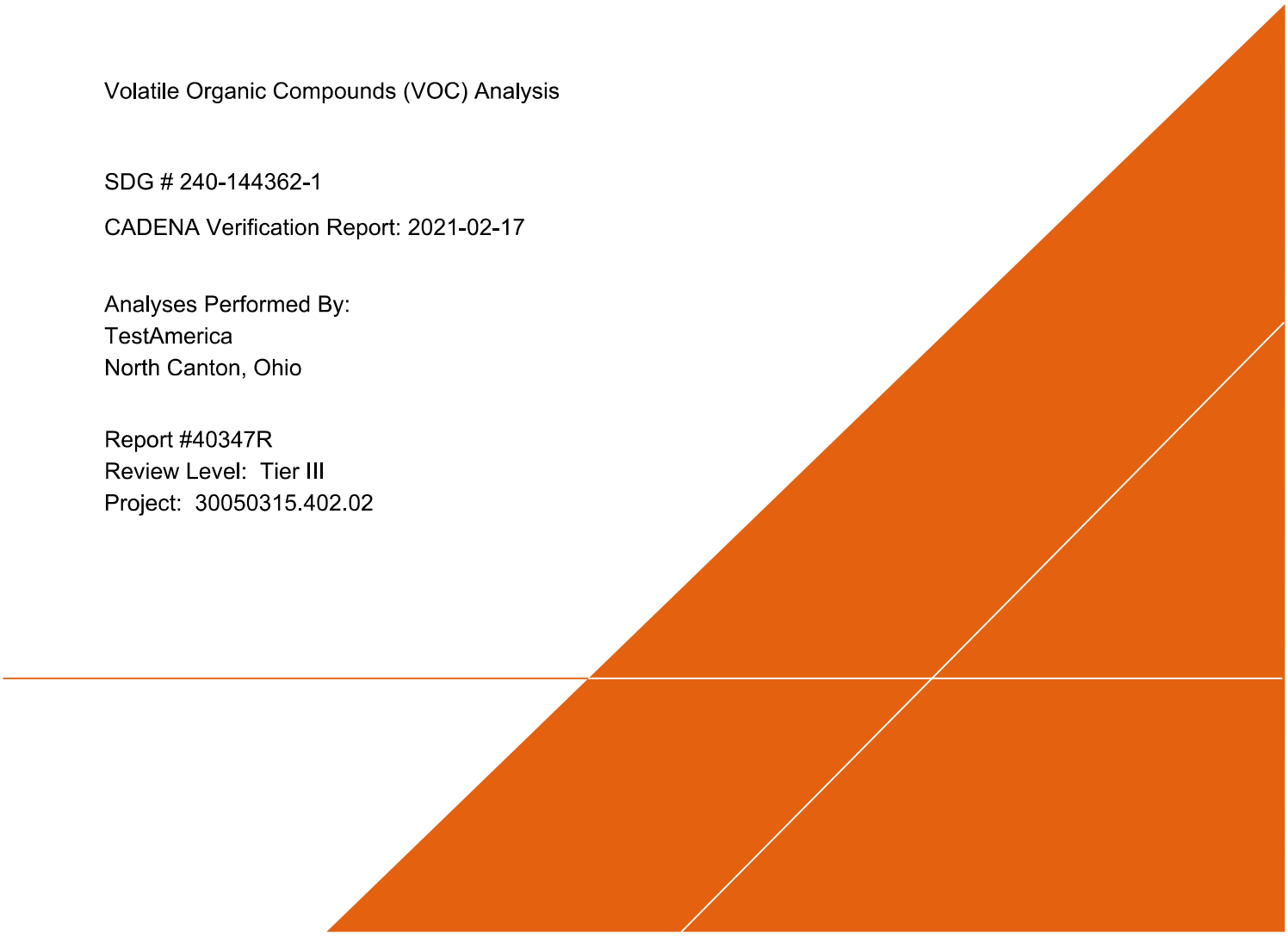
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144362-1

CADENA Verification Report: 2021-02-17

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report #40347R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144362-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					VOC
TRIP BLANK	240-144362-1	Water	02/09/2021		X
MW-162S_020921	240-144362-2	Water	02/09/2021		X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent

sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: February 23, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 05, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

MICHIGAN 190

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Andrew Barritt		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below: 10 day ✓ 3 weeks, 2 weeks, 1 week, 2 days, 1 day

Analyses

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM					Sample Specific Notes / Special Instructions:
TRIP BLANK				1						1					N	G	X	X	X	X	X	X	X					Trip Blank
MW-1625-020921	2/9/21	1645		6						6					N	G	X	X	X	X	X	X	X					3 VOAs for 8260B 3 VOAs for 8260B SIM

240-144362 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ✓ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Andrew Barritt	Arcadis	2/9/21 1810	Noyer Cold Storage	Arcadis	2/9/21 1810
Julia McClafferty	Arcadis	2/10/2021	Amanda Battenhill	ETA	2/10/21 10:12
Amanda Battenhill	ETA	2/10/21 1309	Received in Laboratory by: [signature]	ETA	2-11-21 800

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02/17/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144362-1
Date Collected: 02/09/21 00:00
Matrix: Water
Date Received: 02/11/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 16:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 16:07	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 16:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 16:07	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 16:07	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 16:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*		*02/15/21 16:07*	*1*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*		*02/15/21 16:07*	*1*
Toluene-d8 (Surr)	*99*		*69 - 122*		*02/15/21 16:07*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*02/15/21 16:07*	*1*

Client Sample ID: MW-162S_020921
Lab Sample ID: 240-144362-2
Date Collected: 02/09/21 16:45
Matrix: Water
Date Received: 02/11/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 17:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/12/21 17:06*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 16:29	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 16:29	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 16:29	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 16:29	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 16:29	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 16:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*02/15/21 16:29*	*1*
4-Bromofluorobenzene (Surr)	*90*		*47 - 134*		*02/15/21 16:29*	*1*
Toluene-d8 (Surr)	*102*		*69 - 122*		*02/15/21 16:29*	*1*
Dibromofluoromethane (Surr)	*102*		*78 - 129*		*02/15/21 16:29*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144809-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/10/2021 9:02:40 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144809-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144809-1

Job ID: 240-144809-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144809-1

Comments
No additional comments.

Receipt
The samples were received on 2/24/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.3º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144809-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144809-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144809-1	TRIP BLANK	Water	02/22/21 00:00	02/24/21 08:00	
240-144809-2	MW-144S_022221	Water	02/22/21 11:41	02/24/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144809-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144809-1

No Detections.

Client Sample ID: MW-144S_022221 — Lab Sample ID: 240-144809-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144809-1

Client Sample ID: TRIP BLANK
Date Collected: 02/22/21 00:00
Date Received: 02/24/21 08:00

Lab Sample ID: 240-144809-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 23:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 23:24	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 23:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 23:24	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 23:24	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 23:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*109*		*75 - 130*		*03/01/21 23:24*	*1*
4-Bromofluorobenzene (Surr)	*66*		*47 - 134*		*03/01/21 23:24*	*1*
Toluene-d8 (Surr)	*86*		*69 - 122*		*03/01/21 23:24*	*1*
Dibromofluoromethane (Surr)	*111*		*78 - 129*		*03/01/21 23:24*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144809-1

Client Sample ID: MW-144S_022221
Date Collected: 02/22/21 11:41
Date Received: 02/24/21 08:00

Lab Sample ID: 240-144809-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 16:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 133*		*03/01/21 16:23*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 21:01	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 21:01	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 21:01	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 21:01	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 21:01	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 21:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*113*		*75 - 130*		*03/01/21 21:01*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*03/01/21 21:01*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*03/01/21 21:01*	*1*
Dibromofluoromethane (Surr)	*109*		*78 - 129*		*03/01/21 21:01*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144809-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144807-G-4 MS	Matrix Spike	92	91	89	96
240-144807-H-4 MSD	Matrix Spike Duplicate	86	91	88	90
240-144809-1	TRIP BLANK	109	66	86	111
240-144809-2	MW-144S_022221	113	65	80	109
LCS 240-474892/4	Lab Control Sample	88	89	89	89
MB 240-474892/7	Method Blank	104	70	82	110

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144807-J-4 MS	Matrix Spike	90
240-144807-J-4 MSD	Matrix Spike Duplicate	88
240-144809-2	MW-144S_022221	88
LCS 240-474842/4	Lab Control Sample	90
MB 240-474842/5	Method Blank	86

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474892/7
Matrix: Water
Analysis Batch: 474892

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 15:51	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 15:51	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 15:51	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 15:51	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 15:51	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 15:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*03/01/21 15:51*	*1*
4-Bromofluorobenzene (Surr)	*70*		*47 - 134*		*03/01/21 15:51*	*1*
Toluene-d8 (Surr)	*82*		*69 - 122*		*03/01/21 15:51*	*1*
Dibromofluoromethane (Surr)	*110*		*78 - 129*		*03/01/21 15:51*	*1*

Lab Sample ID: LCS 240-474892/4
Matrix: Water
Analysis Batch: 474892

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.84		ug/L		98	73 - 129
cis-1,2-Dichloroethene	10.0	9.22		ug/L		92	75 - 124
Tetrachloroethene	10.0	10.9		ug/L		109	70 - 125
trans-1,2-Dichloroethene	10.0	9.78		ug/L		98	74 - 130
Trichloroethene	10.0	9.30		ug/L		93	71 - 121
Vinyl chloride	10.0	9.80		ug/L		98	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 130*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*
Toluene-d8 (Surr)	*89*		*69 - 122*
Dibromofluoromethane (Surr)	*89*		*78 - 129*

Lab Sample ID: 240-144807-G-4 MS
Matrix: Water
Analysis Batch: 474892

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.25		ug/L		93	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	9.38		ug/L		94	68 - 121
Tetrachloroethene	1.0	U	10.0	11.7		ug/L		117	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.98		ug/L		100	69 - 126
Trichloroethene	1.0	U	10.0	9.60		ug/L		96	56 - 124
Vinyl chloride	1.0	U	10.0	10.4		ug/L		104	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*
Toluene-d8 (Surr)	*89*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144807-G-4 MS
Matrix: Water
Analysis Batch: 474892

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*96*		*78 - 129*

Lab Sample ID: 240-144807-H-4 MSD
Matrix: Water
Analysis Batch: 474892

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.00		ug/L		90	64 - 132	3	35
cis-1,2-Dichloroethene	1.0	U	10.0	8.99		ug/L		90	68 - 121	4	35
Tetrachloroethene	1.0	U	10.0	11.0		ug/L		110	52 - 129	6	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.43		ug/L		94	69 - 126	6	35
Trichloroethene	1.0	U	10.0	9.01		ug/L		90	56 - 124	6	35
Vinyl chloride	1.0	U	10.0	10.1		ug/L		101	49 - 136	3	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*
Toluene-d8 (Surr)	*88*		*69 - 122*
Dibromofluoromethane (Surr)	*90*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474842/5
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 12:12	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*		*03/01/21 12:12*	*1*

Lab Sample ID: LCS 240-474842/4
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.05		ug/L		91	80 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*70 - 133*

Lab Sample ID: 240-144807-J-4 MS
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	8.95		ug/L		90	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*90*		*70 - 133*

Lab Sample ID: 240-144807-J-4 MSD
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.28		ug/L		93	46 - 170	4	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144809-1

GC/MS VOA

Analysis Batch: 474842

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144809-2	MW-144S_022221	Total/NA	Water	8260B SIM	
MB 240-474842/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474842/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144807-J-4 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144807-J-4 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474892

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144809-1	TRIP BLANK	Total/NA	Water	8260B	
240-144809-2	MW-144S_022221	Total/NA	Water	8260B	
MB 240-474892/7	Method Blank	Total/NA	Water	8260B	
LCS 240-474892/4	Lab Control Sample	Total/NA	Water	8260B	
240-144807-G-4 MS	Matrix Spike	Total/NA	Water	8260B	
240-144807-H-4 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144809-1

Client Sample ID: TRIP BLANK
Date Collected: 02/22/21 00:00
Date Received: 02/24/21 08:00

Lab Sample ID: 240-144809-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474892	03/01/21 23:24	LRW	TAL CAN

Client Sample ID: MW-144S_022221
Date Collected: 02/22/21 11:41
Date Received: 02/24/21 08:00

Lab Sample ID: 240-144809-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474892	03/01/21 21:01	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474842	03/01/21 16:23	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144809-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

1-2/1.3

Chain of Custody Record

MICHIGAN 190 TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Gary Schafer	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/22/21			X						1							X	X	X	X	X	X	X	1 trip blank
MW-1445-022221	02/22/21	11:41		X						6					N	G	X	X	X	X	X	X	X	Method 8260B Method 8260B SIM

240-144809 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	02/22/21 1730	Novi Cold Storage	Arcadis	02/22/21 1730
Julia McClafferty	Arcadis	2/23/2021	Amanda Battenhell	ETA	2/23/21 10:04
Amanda Battenhell	ETA	2/23/21 10:47	Received in Laboratory by:	Company: TA	Date/Time: 2-24-21 800

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3/10/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 144809
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by:

Cooler Received on 2-24-21 Opened on 2-24-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1-2 °C Corrected Cooler Temp. 1-3 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC907861
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page | Samples processed by:

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

March 10, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144809-1
Sample date: 2021-02-22
Report received by CADENA: 2021-03-10
Initial Data Verification completed by CADENA: 2021-03-10
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144809-1

		Sample Name:	TRIP BLANK				MW-144S_022221			
		Lab Sample ID:	2401448091				2401448092			
		Sample Date:	2/22/2021				2/22/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

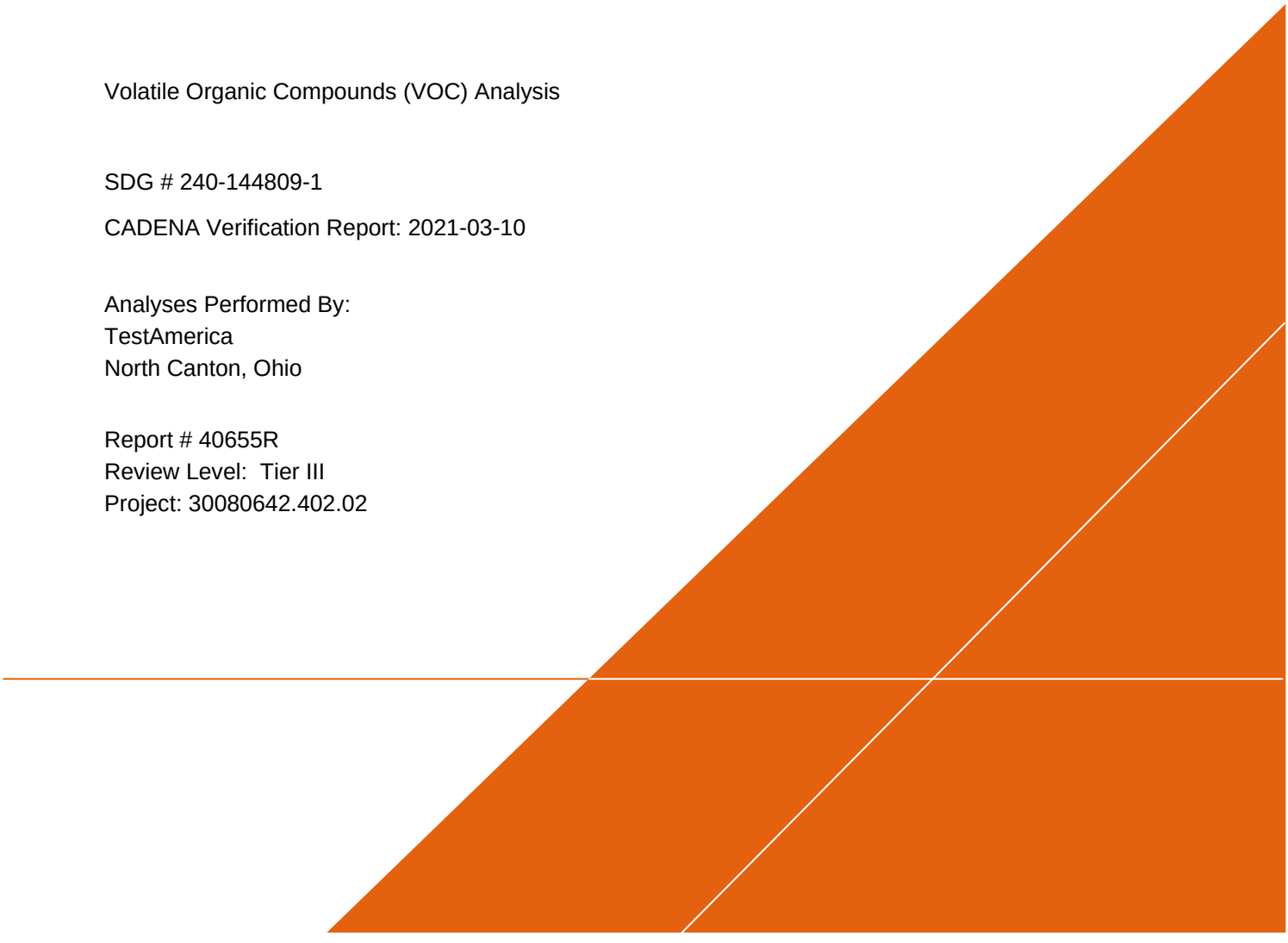
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144809-1

CADENA Verification Report: 2021-03-10

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40655R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144809-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144809-1	Water	02/22/2021		X	
MW-144S_022221	240-144809-2	Water	02/22/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial/Continuing	Compound	Criteria
TRIP BLANK MW-144S_022221	CCV %D	Tetrachloroethene	+21.9%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J

DATA REVIEW

Initial/Continuing	Criteria	Sample Result	Qualification
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1] RRF of 0.01 only applies to compounds which are typically poor responding compounds (i.e., ketones, 1,4-dioxane, etc.)

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

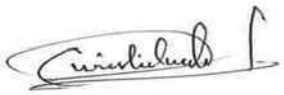
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 22, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 24, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

1-2/1.3

Chain of Custody Record

MICHIGAN 190 TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	For lab use only
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	Walk-in client
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: 10 day; 3 weeks / 2 weeks / 1 week / 2 days / 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30050315.402.04	Shipping/Tracking No:			
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/22/21			X						1							X	X	X	X	X	X	X	trip blank
MW-1445-022221	02/22/21	11:41		X						6					N	G	X	X	X	X	X	X	X	Method 8260B. Method 8260B SIM

240-144809 Chain of Custody

Possible Hazard Identification: Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / Disposal By Lab / Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	02/22/21 1730	Novi Cold Storage	Arcadis	02/22/21 1730
Julia McClafferty	Arcadis	2/23/2021	Amanda Battershell	ETA	2/23/21 10:04
Amanda Battershell	ETA	2/23/21 10:47	Received in Laboratory by:	Company: TA	Date/Time: 2-24-21 800

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03/10/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144809-1
Date Collected: 02/22/21 00:00
Matrix: Water
Date Received: 02/24/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 23:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 23:24	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 23:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 23:24	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 23:24	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 23:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*109*		*75 - 130*		*03/01/21 23:24*	*1*
4-Bromofluorobenzene (Surr)	*66*		*47 - 134*		*03/01/21 23:24*	*1*
Toluene-d8 (Surr)	*86*		*69 - 122*		*03/01/21 23:24*	*1*
Dibromofluoromethane (Surr)	*111*		*78 - 129*		*03/01/21 23:24*	*1*

Client Sample ID: MW-144S_022221
Lab Sample ID: 240-144809-2
Date Collected: 02/22/21 11:41
Matrix: Water
Date Received: 02/24/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 16:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 133*		*03/01/21 16:23*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 21:01	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 21:01	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 21:01	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 21:01	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 21:01	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 21:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*113*		*75 - 130*		*03/01/21 21:01*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*03/01/21 21:01*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*03/01/21 21:01*	*1*
Dibromofluoromethane (Surr)	*109*		*78 - 129*		*03/01/21 21:01*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144504-1
Client Project/Site: Ford LTP - Off Site
Revision: 1

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/26/2021 9:39:21 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144504-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144504-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144504-1

Comments
No additional comments.

Revision
The report being provided is a revision of the original report sent on 2/25/2021. The report (revision 1) is being revised due to: Samples mislabeled during unpacking - revised to correct data..

Receipt
The samples were received on 2/13/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.6° C.

GC/MS VOA
Method 8260B: The following sample was analyzed outside of analytical holding time due to mis-labeled vial: TRIP BLANK (240-144504-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144504-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144504-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144504-1	TRIP BLANK	Water	02/11/21 00:00	02/13/21 08:00	
240-144504-2	MW-119S_021121	Water	02/11/21 15:41	02/13/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144504-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144504-1

No Detections.

Client Sample ID: MW-119S_021121 — Lab Sample ID: 240-144504-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Tetrachloroethene	0.31	J	1.0	0.15	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144504-1

Client Sample ID: TRIP BLANK
Date Collected: 02/11/21 00:00
Date Received: 02/13/21 08:00

Lab Sample ID: 240-144504-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U H	1.0	0.19	ug/L			03/15/21 16:55	1
cis-1,2-Dichloroethene	1.0	U H	1.0	0.16	ug/L			03/15/21 16:55	1
Tetrachloroethene	1.0	U H	1.0	0.15	ug/L			03/15/21 16:55	1
trans-1,2-Dichloroethene	1.0	U H	1.0	0.19	ug/L			03/15/21 16:55	1
Trichloroethene	1.0	U H	1.0	0.10	ug/L			03/15/21 16:55	1
Vinyl chloride	1.0	U H	1.0	0.20	ug/L			03/15/21 16:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*75 - 130*		*03/15/21 16:55*	*1*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*		*03/15/21 16:55*	*1*
Toluene-d8 (Surr)	*96*		*69 - 122*		*03/15/21 16:55*	*1*
Dibromofluoromethane (Surr)	*84*		*78 - 129*		*03/15/21 16:55*	*1*

Client Sample ID: MW-119S_021121

Date Collected: 02/11/21 15:41
Date Received: 02/13/21 08:00

Lab Sample ID: 240-144504-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 21:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*78*		*70 - 133*		*02/18/21 21:42*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 20:47	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 20:47	1
Tetrachloroethene	**0.31**	**J**	1.0	0.15	ug/L			02/22/21 20:47	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 20:47	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 20:47	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/22/21 20:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*75 - 130*		*02/22/21 20:47*	*1*
4-Bromofluorobenzene (Surr)	*62*		*47 - 134*		*02/22/21 20:47*	*1*
Toluene-d8 (Surr)	*77*		*69 - 122*		*02/22/21 20:47*	*1*
Dibromofluoromethane (Surr)	*116*		*78 - 129*		*02/22/21 20:47*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144504-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
190-25454-E-1 MS	Matrix Spike	79	97	95	83
190-25454-F-1 MSD	Matrix Spike Duplicate	84	95	95	86
240-144504-1	TRIP BLANK	81	95	96	84
240-144504-2	MW-119S_021121	112	62	77	116
240-144518-G-2 MSD	Matrix Spike Duplicate	80	87	87	96
240-144518-H-2 MS	Matrix Spike	88	96	91	95
LCS 240-473958/4	Lab Control Sample	91	90	88	95
LCS 240-476776/4	Lab Control Sample	78	94	97	83
MB 240-473958/7	Method Blank	112	68	79	114
MB 240-476776/7	Method Blank	80	91	98	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144425-C-2 MS	Matrix Spike	82
240-144425-C-2 MSD	Matrix Spike Duplicate	81
240-144504-2	MW-119S_021121	78
LCS 240-473604/4	Lab Control Sample	81
MB 240-473604/5	Method Blank	80

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473958/7
Matrix: Water
Analysis Batch: 473958

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 16:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 16:24	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 16:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 16:24	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 16:24	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/22/21 16:24	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*75 - 130*		*02/22/21 16:24*	*1*
4-Bromofluorobenzene (Surr)	*68*		*47 - 134*		*02/22/21 16:24*	*1*
Toluene-d8 (Surr)	*79*		*69 - 122*		*02/22/21 16:24*	*1*
Dibromofluoromethane (Surr)	*114*		*78 - 129*		*02/22/21 16:24*	*1*

Lab Sample ID: LCS 240-473958/4
Matrix: Water
Analysis Batch: 473958

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.9		ug/L		109	73 - 129
cis-1,2-Dichloroethene	10.0	10.0		ug/L		100	75 - 124
Tetrachloroethene	10.0	12.2		ug/L		122	70 - 125
trans-1,2-Dichloroethene	10.0	11.0		ug/L		110	74 - 130
Trichloroethene	10.0	10.1		ug/L		101	71 - 121
Vinyl chloride	10.0	9.31		ug/L		93	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*91*		*75 - 130*
4-Bromofluorobenzene (Surr)	*90*		*47 - 134*
Toluene-d8 (Surr)	*88*		*69 - 122*
Dibromofluoromethane (Surr)	*95*		*78 - 129*

Lab Sample ID: 240-144518-G-2 MSD
Matrix: Water
Analysis Batch: 473958

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.98		ug/L		100	64 - 132	3	35
cis-1,2-Dichloroethene	1.0	U	10.0	10.1		ug/L		101	68 - 121	7	35
Tetrachloroethene	1.0	U	10.0	10.7		ug/L		107	52 - 129	2	35
trans-1,2-Dichloroethene	1.0	U	10.0	10.2		ug/L		102	69 - 126	2	35
Trichloroethene	1.0	U	10.0	9.58		ug/L		96	56 - 124	1	35
Vinyl chloride	1.0	U	10.0	9.46		ug/L		95	49 - 136	3	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*80*		*75 - 130*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*
Toluene-d8 (Surr)	*87*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144518-G-2 MSD
Matrix: Water
Analysis Batch: 473958

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*96*		*78 - 129*

Lab Sample ID: 240-144518-H-2 MS
Matrix: Water
Analysis Batch: 473958

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.71		ug/L		97	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	9.40		ug/L		94	68 - 121
Tetrachloroethene	1.0	U	10.0	11.0		ug/L		110	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	69 - 126
Trichloroethene	1.0	U	10.0	9.67		ug/L		97	56 - 124
Vinyl chloride	1.0	U	10.0	9.16		ug/L		92	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 130*
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*
Toluene-d8 (Surr)	*91*		*69 - 122*
Dibromofluoromethane (Surr)	*95*		*78 - 129*

Lab Sample ID: MB 240-476776/7
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/15/21 15:40	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/15/21 15:40	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/15/21 15:40	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/15/21 15:40	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/15/21 15:40	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/15/21 15:40	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*75 - 130*		*03/15/21 15:40*	*1*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*		*03/15/21 15:40*	*1*
Toluene-d8 (Surr)	*98*		*69 - 122*		*03/15/21 15:40*	*1*
Dibromofluoromethane (Surr)	*81*		*78 - 129*		*03/15/21 15:40*	*1*

Lab Sample ID: LCS 240-476776/4
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.48		ug/L		85	73 - 129
cis-1,2-Dichloroethene	10.0	9.17		ug/L		92	75 - 124
Tetrachloroethene	10.0	10.2		ug/L		102	70 - 125
trans-1,2-Dichloroethene	10.0	8.93		ug/L		89	74 - 130
Trichloroethene	10.0	8.97		ug/L		90	71 - 121

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-476776/4
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Vinyl chloride			10.0	11.1		ug/L		111	61 - 134		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*78*		*75 - 130*
4-Bromofluorobenzene (Surr)	*94*		*47 - 134*
Toluene-d8 (Surr)	*97*		*69 - 122*
Dibromofluoromethane (Surr)	*83*		*78 - 129*

Lab Sample ID: 190-25454-E-1 MS
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,1-Dichloroethene	1.0	U	10.0	6.81		ug/L		68	64 - 132		
cis-1,2-Dichloroethene	1.0	U	10.0	7.96		ug/L		80	68 - 121		
Tetrachloroethene	1.0	U	10.0	8.88		ug/L		89	52 - 129		
trans-1,2-Dichloroethene	1.0	U	10.0	7.48		ug/L		75	69 - 126		
Trichloroethene	1.0	U	10.0	7.78		ug/L		78	56 - 124		
Vinyl chloride	1.0	U	10.0	9.92		ug/L		99	49 - 136		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*75 - 130*
4-Bromofluorobenzene (Surr)	*97*		*47 - 134*
Toluene-d8 (Surr)	*95*		*69 - 122*
Dibromofluoromethane (Surr)	*83*		*78 - 129*

Lab Sample ID: 190-25454-F-1 MSD
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	6.82		ug/L		68	64 - 132	0	35
cis-1,2-Dichloroethene	1.0	U	10.0	8.09		ug/L		81	68 - 121	2	35
Tetrachloroethene	1.0	U	10.0	8.78		ug/L		88	52 - 129	1	35
trans-1,2-Dichloroethene	1.0	U	10.0	7.87		ug/L		79	69 - 126	5	35
Trichloroethene	1.0	U	10.0	8.10		ug/L		81	56 - 124	4	35
Vinyl chloride	1.0	U	10.0	10.4		ug/L		104	49 - 136	4	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*95*		*69 - 122*
Dibromofluoromethane (Surr)	*86*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473604/5
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 12:27	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/18/21 12:27*	*1*

Lab Sample ID: LCS 240-473604/4
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.5		ug/L		105	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

Lab Sample ID: 240-144425-C-2 MS
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	11.1		ug/L		111	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144425-C-2 MSD
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.7		ug/L		107	46 - 170	3	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

GC/MS VOA

Analysis Batch: 473604

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144504-2	MW-119S_021121	Total/NA	Water	8260B SIM	
MB 240-473604/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-473604/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144425-C-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144425-C-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 473958

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144504-2	MW-119S_021121	Total/NA	Water	8260B	
MB 240-473958/7	Method Blank	Total/NA	Water	8260B	
LCS 240-473958/4	Lab Control Sample	Total/NA	Water	8260B	
240-144518-G-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	
240-144518-H-2 MS	Matrix Spike	Total/NA	Water	8260B	

Analysis Batch: 476776

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144504-1	TRIP BLANK	Total/NA	Water	8260B	
MB 240-476776/7	Method Blank	Total/NA	Water	8260B	
LCS 240-476776/4	Lab Control Sample	Total/NA	Water	8260B	
190-25454-E-1 MS	Matrix Spike	Total/NA	Water	8260B	
190-25454-F-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144504-1

Client Sample ID: TRIP BLANK
Date Collected: 02/11/21 00:00
Date Received: 02/13/21 08:00

Lab Sample ID: 240-144504-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	476776	03/15/21 16:55	LRW	TAL CAN

Client Sample ID: MW-119S_021121
Date Collected: 02/11/21 15:41
Date Received: 02/13/21 08:00

Lab Sample ID: 240-144504-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473958	02/22/21 20:47	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	473604	02/18/21 21:42	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144504-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact				
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:	10 day		Lab sampling:
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac / NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK				X						1							X	X	X	X	X	X	X	trip blank
MW-1195-021121	02/11/21	15:41		X						6					N	G	X	X	X	X	X	X	X	3 VOAs Method 8260B. 3 VOAs Method 8260Sim

240-144504 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	02/11/21 1745	Nov. cold Storage	Arcadis	02/11/21 1746
[signature]	Arcadis	2/12/2021	[signature]	ETA	2/12/21 10:05
[signature]	ETA	2/12/21 11:01	[signature]	ETA	2-13-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 144504**
Canton Facility

Client Arcadis Site Name

Cooler unpacked by: Ryan C

Cooler Received on 2-13-21 Opened on 2-13-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.5 °C Corrected Cooler Temp. 1.6 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 59072	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

March 26, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144504-1
Sample date: 2021-02-11
Report received by CADENA: 2021-03-26
Initial Data Verification completed by CADENA: 2021-03-26
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

> HTQ - GCMS VOC sample TRIP BLANK analysis was performed outside of reference holding time due to an initial sample mix-up so all associated results should be considered to be estimated and qualified with UJ flags if non-detect.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Qualified Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144504-1

Sample Name: TRIP BLANK
Lab Sample ID: 2401445041
Sample Date: 2/11/2021

Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC					
OSW-8260B					
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	UJ
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	UJ
Tetrachloroethene	127-18-4	ND	1.0	ug/l	UJ
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	UJ
Trichloroethene	79-01-6	ND	1.0	ug/l	UJ
Vinyl chloride	75-01-4	ND	1.0	ug/l	UJ

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144504-1

		Sample Name:	TRIP BLANK				MW-119S_021121			
		Lab Sample ID:	2401445041				2401445042			
		Sample Date:	2/11/2021				2/11/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	UJ	0.31	1.0	ug/l	J
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

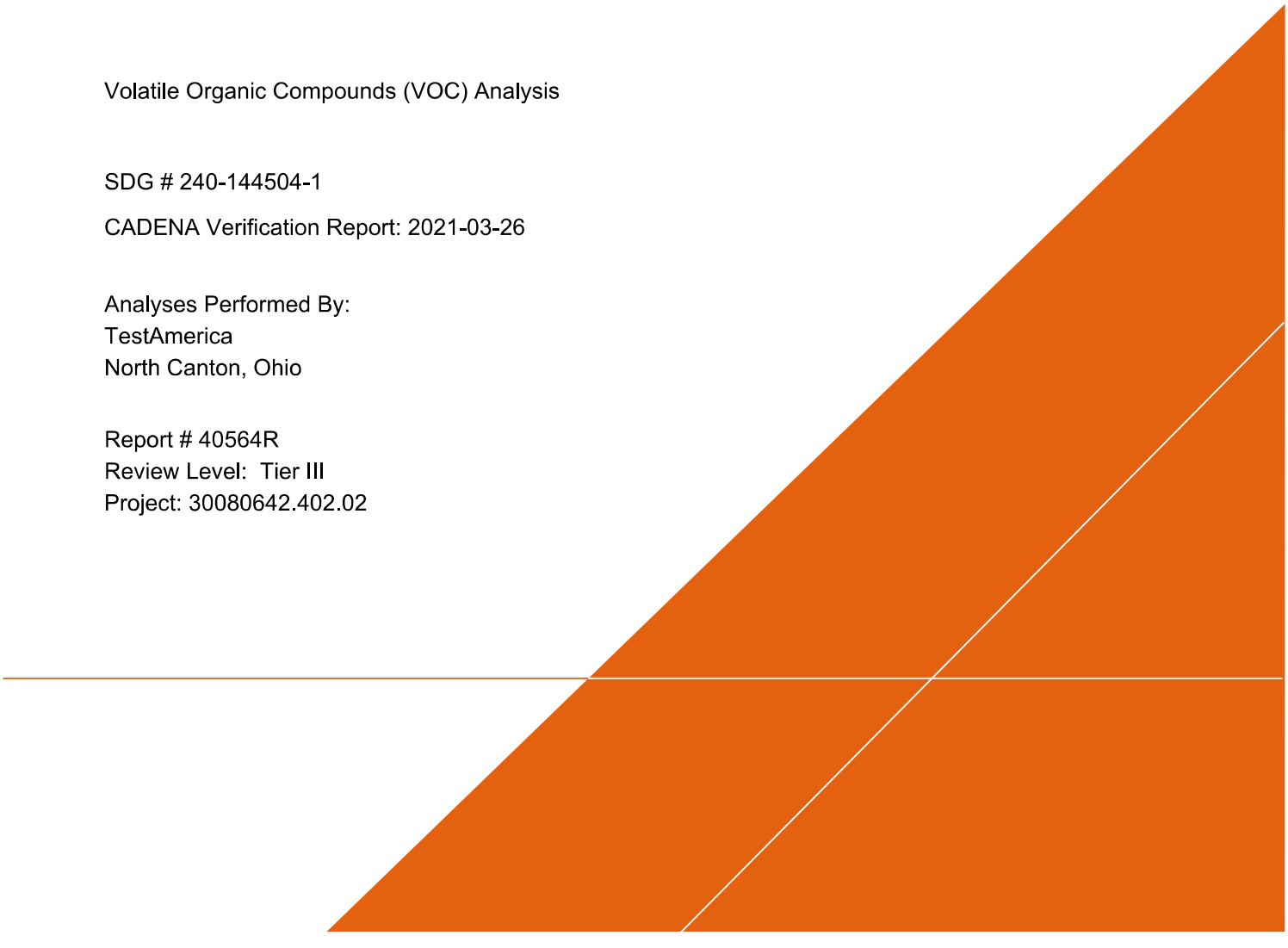
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144504-1

CADENA Verification Report: 2021-03-26

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40564R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144504-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144504-1	Water	02/11/2021		X	
MW-119S_021121	240-144504-2	Water	02/11/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

The analyses that exceeded the holding are presented in the following table.

Sample ID	Holding Time	Criteria
TRIP BLANK	32 days	14 days from collection to analysis

Sample results associated with samples mentioned in the table above, analyzed by analytical method SW-846 8260B were qualified, as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

DATA REVIEW

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X	X		
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

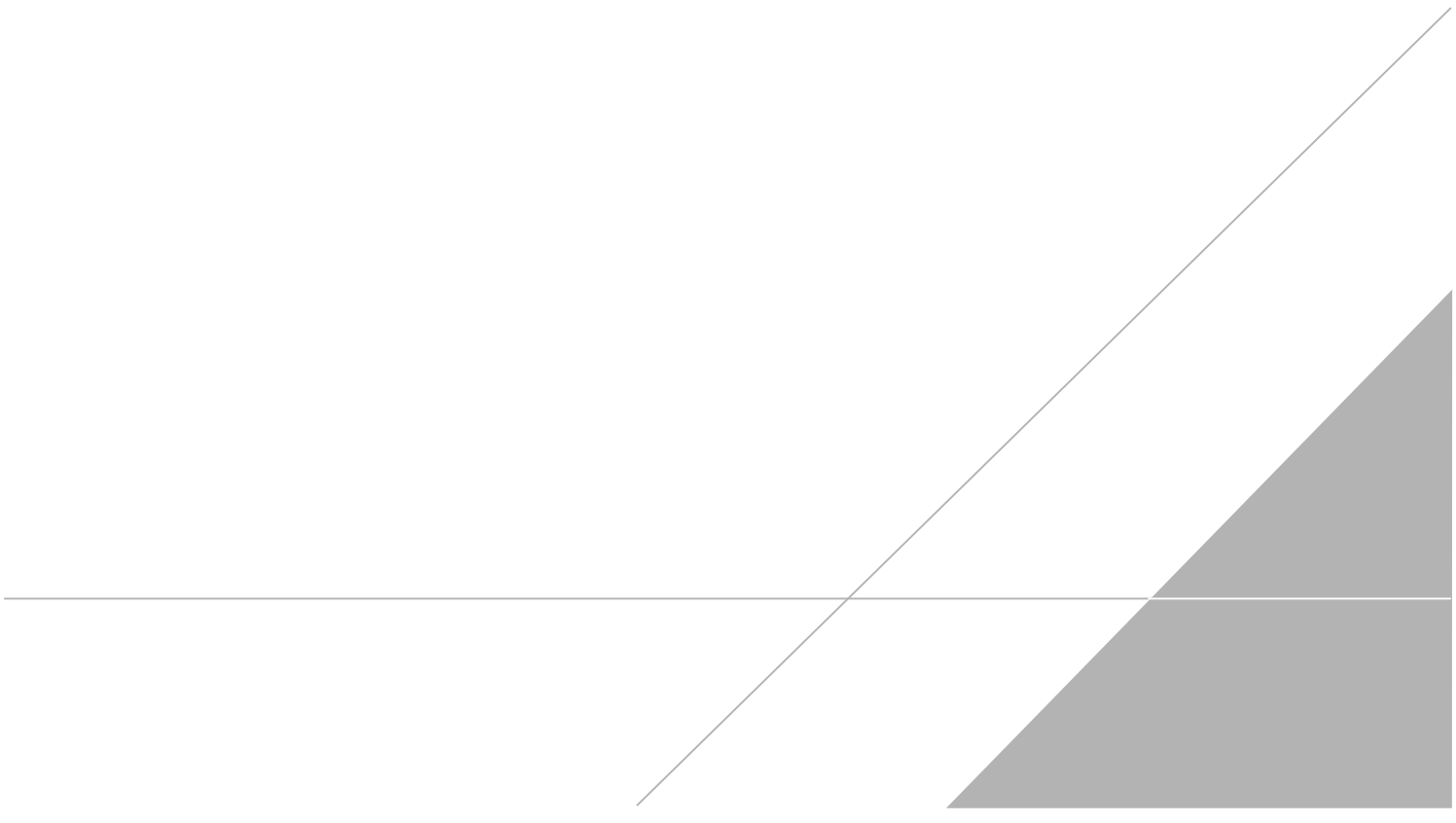
DATE: March 30, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 30, 2021

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client: Lab sampling:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK				X						1							X	X	X	X	X	X	X	1 trip blank
MW-1195-021121	02/11/21	15:41		X						6					N	G	X	X	X	X	X	X	X	3 VOAs Method 8260B. 3 VOAs Method 8260Sim

240-144504 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	02/11/21 1745	Novi cold Storage	Arcadis	02/11/21 1746
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Arcadis	2/12/2021	Amanda Battenfield	ETA	2/12/21 1005
Relinquished by: Amanda Battenfield	Company: ETA	Date/Time: 2/12/21 11:01	Received in Laboratory by:	Company: ETA	Date/Time: 2-13-21 800

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144504-1

Date Collected: 02/11/21 00:00
Matrix: Water
Date Received: 02/13/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
~~1,1-Dichloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.19~~	~~ug/L~~			~~03/15/21 16:55~~	R 1
~~cis-1,2-Dichloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.16~~	~~ug/L~~			~~03/15/21 16:55~~	R 1
~~Tetrachloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.15~~	~~ug/L~~			~~03/15/21 16:55~~	R 1
~~trans-1,2-Dichloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.19~~	~~ug/L~~			~~03/15/21 16:55~~	R 1
~~Trichloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.10~~	~~ug/L~~			~~03/15/21 16:55~~	R 1
~~Vinyl chloride~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.20~~	~~ug/L~~			~~03/15/21 16:55~~	R 1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*75 - 130*		*03/15/21 16:55*	*1*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*		*03/15/21 16:55*	*1*
Toluene-d8 (Surr)	*96*		*69 - 122*		*03/15/21 16:55*	*1*
Dibromofluoromethane (Surr)	*84*		*78 - 129*		*03/15/21 16:55*	*1*

Client Sample ID: MW-119S_021121
Lab Sample ID: 240-144504-2

Date Collected: 02/11/21 15:41
Matrix: Water
Date Received: 02/13/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 21:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*78*		*70 - 133*		*02/18/21 21:42*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 20:47	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 20:47	1
Tetrachloroethene	**0.31**	**J**	1.0	0.15	ug/L			02/22/21 20:47	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 20:47	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 20:47	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/22/21 20:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*75 - 130*		*02/22/21 20:47*	*1*
4-Bromofluorobenzene (Surr)	*62*		*47 - 134*		*02/22/21 20:47*	*1*
Toluene-d8 (Surr)	*77*		*69 - 122*		*02/22/21 20:47*	*1*
Dibromofluoromethane (Surr)	*116*		*78 - 129*		*02/22/21 20:47*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144365-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
2/19/2021 11:37:38 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144365-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144365-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144365-1

Comments
No additional comments.

Receipt
The samples were received on 2/11/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.2° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144365-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144365-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144365-1	TRIP BLANK	Water	02/09/21 00:00	02/11/21 08:00	
240-144365-2	MW-91S_020921	Water	02/09/21 11:41	02/11/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144365-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144365-1

No Detections.

Client Sample ID: MW-91S_020921 — Lab Sample ID: 240-144365-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144365-1

Client Sample ID: TRIP BLANK
Date Collected: 02/09/21 00:00
Date Received: 02/11/21 08:00

Lab Sample ID: 240-144365-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 18:21	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 18:21	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 18:21	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 18:21	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 18:21	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 18:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*75 - 130*		*02/15/21 18:21*	*1*
4-Bromofluorobenzene (Surr)	*90*		*47 - 134*		*02/15/21 18:21*	*1*
Toluene-d8 (Surr)	*96*		*69 - 122*		*02/15/21 18:21*	*1*
Dibromofluoromethane (Surr)	*100*		*78 - 129*		*02/15/21 18:21*	*1*

Client Sample ID: MW-91S_020921
Date Collected: 02/09/21 11:41
Date Received: 02/11/21 08:00

Lab Sample ID: 240-144365-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 18:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*70 - 133*		*02/12/21 18:22*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 10:51	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 10:51	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 10:51	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 10:51	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 10:51	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 10:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*02/17/21 10:51*	*1*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*		*02/17/21 10:51*	*1*
Toluene-d8 (Surr)	*104*		*69 - 122*		*02/17/21 10:51*	*1*
Dibromofluoromethane (Surr)	*101*		*78 - 129*		*02/17/21 10:51*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144365-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144277-B-2 MS	Matrix Spike	91	95	105	99
240-144277-B-2 MSD	Matrix Spike Duplicate	93	90	99	99
240-144365-1	TRIP BLANK	99	90	96	100
240-144365-2	MW-91S_020921	100	95	104	101
240-144438-B-2 MS	Matrix Spike	90	89	97	96
240-144438-B-2 MSD	Matrix Spike Duplicate	87	83	92	90
LCS 240-473047/4	Lab Control Sample	99	102	106	104
LCS 240-473375/4	Lab Control Sample	93	96	100	98
MB 240-473047/6	Method Blank	86	81	92	93
MB 240-473375/6	Method Blank	99	96	104	99

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144365-2	MW-91S_020921	85
240-144376-F-3 MS	Matrix Spike	83
240-144376-F-3 MSD	Matrix Spike Duplicate	82
LCS 240-472900/4	Lab Control Sample	82
MB 240-472900/5	Method Blank	82

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473047/6
Matrix: Water
Analysis Batch: 473047

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 10:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 10:57	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 10:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 10:57	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 10:57	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 10:57	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*		*02/15/21 10:57*	*1*
4-Bromofluorobenzene (Surr)	*81*		*47 - 134*		*02/15/21 10:57*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*02/15/21 10:57*	*1*
Dibromofluoromethane (Surr)	*93*		*78 - 129*		*02/15/21 10:57*	*1*

Lab Sample ID: LCS 240-473047/4
Matrix: Water
Analysis Batch: 473047

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	11.1		ug/L		111	73 - 129
cis-1,2-Dichloroethene	10.0	10.6		ug/L		106	75 - 124
Tetrachloroethene	10.0	11.4		ug/L		114	70 - 125
trans-1,2-Dichloroethene	10.0	10.4		ug/L		104	74 - 130
Trichloroethene	10.0	10.4		ug/L		104	71 - 121
Vinyl chloride	10.0	9.92		ug/L		99	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*99*		*75 - 130*
4-Bromofluorobenzene (Surr)	*102*		*47 - 134*
Toluene-d8 (Surr)	*106*		*69 - 122*
Dibromofluoromethane (Surr)	*104*		*78 - 129*

Lab Sample ID: 240-144277-B-2 MS
Matrix: Water
Analysis Batch: 473047

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	67	U	667	598		ug/L		90	64 - 132
cis-1,2-Dichloroethene	1500		667	2140		ug/L		102	68 - 121
Tetrachloroethene	56	J	667	634		ug/L		87	52 - 129
Trichloroethene	1100		667	1670		ug/L		91	56 - 124
Vinyl chloride	160		667	734		ug/L		86	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*91*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*105*		*69 - 122*
Dibromofluoromethane (Surr)	*99*		*78 - 129*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144277-B-2 MSD
Matrix: Water
Analysis Batch: 473047

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	67	U	667	668		ug/L		100	64 - 132	11	35
cis-1,2-Dichloroethene	1500		667	2220		ug/L		113	68 - 121	3	35
Tetrachloroethene	56	J	667	730		ug/L		101	52 - 129	14	35
Trichloroethene	1100		667	1740		ug/L		101	56 - 124	4	35
Vinyl chloride	160		667	774		ug/L		92	49 - 136	5	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*90*		*47 - 134*
Toluene-d8 (Surr)	*99*		*69 - 122*
Dibromofluoromethane (Surr)	*99*		*78 - 129*

Lab Sample ID: MB 240-473375/6
Matrix: Water
Analysis Batch: 473375

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 09:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 09:44	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 09:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 09:44	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 09:44	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 09:44	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*75 - 130*		*02/17/21 09:44*	*1*
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*		*02/17/21 09:44*	*1*
Toluene-d8 (Surr)	*104*		*69 - 122*		*02/17/21 09:44*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*02/17/21 09:44*	*1*

Lab Sample ID: LCS 240-473375/4
Matrix: Water
Analysis Batch: 473375

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.85		ug/L		98	73 - 129
cis-1,2-Dichloroethene	10.0	9.66		ug/L		97	75 - 124
Tetrachloroethene	10.0	10.4		ug/L		104	70 - 125
trans-1,2-Dichloroethene	10.0	9.74		ug/L		97	74 - 130
Trichloroethene	10.0	9.92		ug/L		99	71 - 121
Vinyl chloride	10.0	10.2		ug/L		102	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*
Toluene-d8 (Surr)	*100*		*69 - 122*
Dibromofluoromethane (Surr)	*98*		*78 - 129*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144438-B-2 MS
Matrix: Water
Analysis Batch: 473375

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1000	U	10000	8730		ug/L		87	64 - 132
cis-1,2-Dichloroethene	21000	F1	10000	26900	F1	ug/L		63	68 - 121
Tetrachloroethene	870	J	10000	9300		ug/L		84	52 - 129
trans-1,2-Dichloroethene	200	J	10000	8950		ug/L		87	69 - 126
Trichloroethene	6700		10000	14700		ug/L		80	56 - 124
Vinyl chloride	1000	U	10000	9030		ug/L		90	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*75 - 130*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*
Toluene-d8 (Surr)	*97*		*69 - 122*
Dibromofluoromethane (Surr)	*96*		*78 - 129*

Lab Sample ID: 240-144438-B-2 MSD
Matrix: Water
Analysis Batch: 473375

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1000	U	10000	9900		ug/L		99	64 - 132	13	35
cis-1,2-Dichloroethene	21000	F1	10000	29700		ug/L		91	68 - 121	10	35
Tetrachloroethene	870	J	10000	10900		ug/L		101	52 - 129	16	35
trans-1,2-Dichloroethene	200	J	10000	9770		ug/L		96	69 - 126	9	35
Trichloroethene	6700		10000	15400		ug/L		87	56 - 124	5	35
Vinyl chloride	1000	U	10000	9850		ug/L		99	49 - 136	9	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 130*
4-Bromofluorobenzene (Surr)	*83*		*47 - 134*
Toluene-d8 (Surr)	*92*		*69 - 122*
Dibromofluoromethane (Surr)	*90*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-472900/5
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 12:29	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/12/21 12:29*	*1*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-472900/4
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.6		ug/L		106	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144376-F-3 MS
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	10.8		ug/L		108	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*

Lab Sample ID: 240-144376-F-3 MSD
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.8		ug/L		108	46 - 170	1	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144365-1

GC/MS VOA

Analysis Batch: 472900

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144365-2	MW-91S_020921	Total/NA	Water	8260B SIM	
MB 240-472900/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-472900/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144376-F-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144376-F-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 473047

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144365-1	TRIP BLANK	Total/NA	Water	8260B	
MB 240-473047/6	Method Blank	Total/NA	Water	8260B	
LCS 240-473047/4	Lab Control Sample	Total/NA	Water	8260B	
240-144277-B-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144277-B-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 473375

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144365-2	MW-91S_020921	Total/NA	Water	8260B	
MB 240-473375/6	Method Blank	Total/NA	Water	8260B	
LCS 240-473375/4	Lab Control Sample	Total/NA	Water	8260B	
240-144438-B-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144438-B-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144365-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144365-1

Date Collected: 02/09/21 00:00

Matrix: Water

Date Received: 02/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473047	02/15/21 18:21	LEE	TAL CAN

Client Sample ID: MW-91S_020921

Lab Sample ID: 240-144365-2

Date Collected: 02/09/21 11:41

Matrix: Water

Date Received: 02/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473375	02/17/21 10:51	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	472900	02/12/21 18:22	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144365-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190

TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Regulatory program: DW NPDES RCRA Other

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Andrew Baritt	TAT if different from below: 10 day; 3 weeks / 2 weeks / 1 week / 2 days / 1 day		Walk-in client; Lab sampling; Job/SDG No:
Phone: 248-994-2240	Method of Shipment/Carrier:			
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK				1						1					N	G	X	X	X	X	X	X	X	Trip Blank
MW-915_020921	2/9/21	1141		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260BSIM

240-144365 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	2/9/21 1810	Novi Gold Storage	Arcadis	2/9/21 1810
[signature]	Arcadis	2/10/2021	[signature]	ETA	2/10/21 10:12
[signature]	ETA	2/10/21 1309	[signature]	ETA	2-11-21 800

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2/19/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 144365**
Canton Facility

Client Arcadis Site Name

Cooler Received on 2-11-21 Opened on 2-11-21

Cooler unpacked by: Matt Snyder

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # VA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2.1 °C Corrected Cooler Temp. 2.2 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	(Yes)	No
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?	(Y)	(Y) (N)
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 211201E	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

February 19, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144365-1
Sample date: 2021-02-09
Report received by CADENA: 2021-02-19
Initial Data Verification completed by CADENA: 2021-02-19
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch MS/MSD recovery outliers were not determined using a client sample so qualification was not required based on these sample-specific QC outliers.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144365-1

		Sample Name:	TRIP BLANK				MW-91S_020921			
		Lab Sample ID:	2401443651				2401443652			
		Sample Date:	2/9/2021				2/9/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS Design & Consultancy for natural and built assets

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

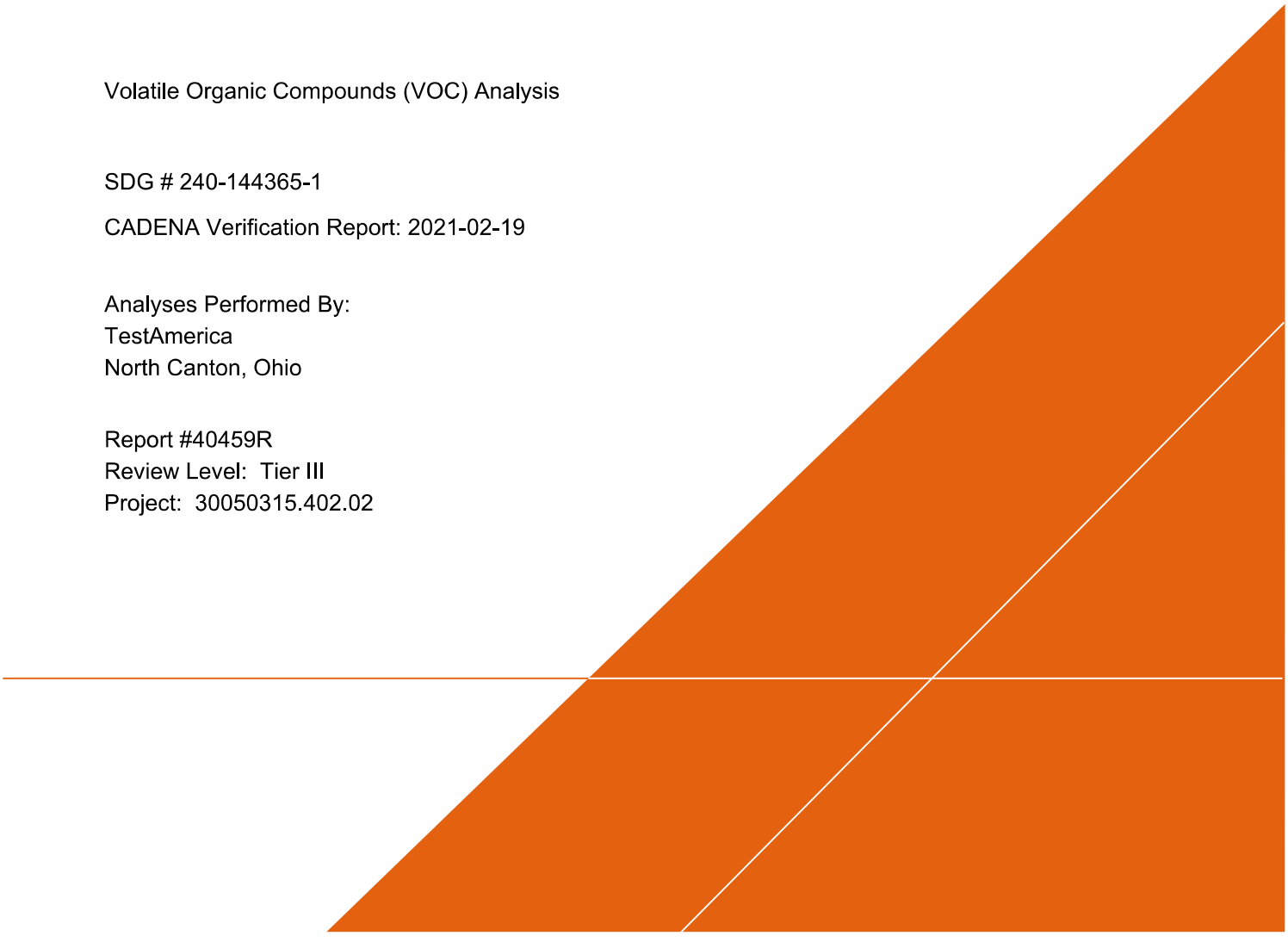
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144365-1

CADENA Verification Report: 2021-02-19

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report #40459R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144365-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					VOC
TRIP BLANK	240-144365-1	Water	02/09/2021		X
MW-91S_020921	240-144365-2	Water	02/09/2021		X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Prashanth K

SIGNATURE: 

DATE: March 09, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 10, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190

TestAmerica — THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Regulatory program: DW NPDES RCRA Other

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Andrew Baritt	TAT if different from below: 10 day; 3 weeks / 2 weeks / 1 week / 2 days / 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK				1						1					N	G	X	X	X	X	X	X	X	Trip Blank
MW-915_020921	2/9/21	1141		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-144365 Chain of Custody

Possible Hazard Identification: Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / Disposal By Lab / Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalla@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by:	Arcadis	2/9/21 1810	Received by: Novi Gold Storage	Arcadis	2/9/21 1810
Relinquished by:	Arcadis	2/10/2021	Received by:	ETA	2/10/21 10:12
Relinquished by:	ETA	2/10/21 1309	Received in Laboratory by:	ETA	2-11-21 800

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02/19/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144365-1
Date Collected: 02/09/21 00:00
Matrix: Water
Date Received: 02/11/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 18:21	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 18:21	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 18:21	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 18:21	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 18:21	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 18:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*75 - 130*		*02/15/21 18:21*	*1*
4-Bromofluorobenzene (Surr)	*90*		*47 - 134*		*02/15/21 18:21*	*1*
Toluene-d8 (Surr)	*96*		*69 - 122*		*02/15/21 18:21*	*1*
Dibromofluoromethane (Surr)	*100*		*78 - 129*		*02/15/21 18:21*	*1*

Client Sample ID: MW-91S_020921
Lab Sample ID: 240-144365-2
Date Collected: 02/09/21 11:41
Matrix: Water
Date Received: 02/11/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 18:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*70 - 133*		*02/12/21 18:22*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 10:51	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 10:51	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 10:51	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 10:51	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 10:51	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 10:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*02/17/21 10:51*	*1*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*		*02/17/21 10:51*	*1*
Toluene-d8 (Surr)	*104*		*69 - 122*		*02/17/21 10:51*	*1*
Dibromofluoromethane (Surr)	*101*		*78 - 129*		*02/17/21 10:51*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144363-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
2/17/2021 10:32:28 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at:
www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144363-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144363-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144363-1

Comments
No additional comments.

Receipt
The samples were received on 2/11/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.2° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144363-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144363-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144363-1	TRIP BLANK	Water	02/09/21 00:00	02/11/21 08:00	
240-144363-2	MW-92S_020921	Water	02/09/21 13:19	02/11/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144363-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144363-1

No Detections.

Client Sample ID: MW-92S_020921 — Lab Sample ID: 240-144363-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144363-1

Client Sample ID: TRIP BLANK
Date Collected: 02/09/21 00:00
Date Received: 02/11/21 08:00

Lab Sample ID: 240-144363-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 16:51	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 16:51	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 16:51	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 16:51	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 16:51	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 16:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*75 - 130*		*02/15/21 16:51*	*1*
4-Bromofluorobenzene (Surr)	*85*		*47 - 134*		*02/15/21 16:51*	*1*
Toluene-d8 (Surr)	*99*		*69 - 122*		*02/15/21 16:51*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*02/15/21 16:51*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144363-1

Client Sample ID: MW-92S_020921

Date Collected: 02/09/21 13:19
Date Received: 02/11/21 08:00

Lab Sample ID: 240-144363-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 17:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*70 - 133*		*02/12/21 17:32*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 17:14	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 17:14	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 17:14	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 17:14	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 17:14	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 17:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*75 - 130*		*02/15/21 17:14*	*1*
4-Bromofluorobenzene (Surr)	*84*		*47 - 134*		*02/15/21 17:14*	*1*
Toluene-d8 (Surr)	*97*		*69 - 122*		*02/15/21 17:14*	*1*
Dibromofluoromethane (Surr)	*96*		*78 - 129*		*02/15/21 17:14*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144363-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144277-B-2 MS	Matrix Spike	91	95	105	99
240-144277-B-2 MSD	Matrix Spike Duplicate	93	90	99	99
240-144363-1	TRIP BLANK	95	85	99	98
240-144363-2	MW-92S_020921	95	84	97	96
LCS 240-473047/4	Lab Control Sample	99	102	106	104
MB 240-473047/6	Method Blank	86	81	92	93

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144363-2	MW-92S_020921	85
240-144376-F-3 MS	Matrix Spike	83
240-144376-F-3 MSD	Matrix Spike Duplicate	82
LCS 240-472900/4	Lab Control Sample	82
MB 240-472900/5	Method Blank	82

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473047/6
Matrix: Water
Analysis Batch: 473047

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 10:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 10:57	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 10:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 10:57	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 10:57	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 10:57	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*		*02/15/21 10:57*	*1*
4-Bromofluorobenzene (Surr)	*81*		*47 - 134*		*02/15/21 10:57*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*02/15/21 10:57*	*1*
Dibromofluoromethane (Surr)	*93*		*78 - 129*		*02/15/21 10:57*	*1*

Lab Sample ID: LCS 240-473047/4
Matrix: Water
Analysis Batch: 473047

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	11.1		ug/L		111	73 - 129
cis-1,2-Dichloroethene	10.0	10.6		ug/L		106	75 - 124
Tetrachloroethene	10.0	11.4		ug/L		114	70 - 125
trans-1,2-Dichloroethene	10.0	10.4		ug/L		104	74 - 130
Trichloroethene	10.0	10.4		ug/L		104	71 - 121
Vinyl chloride	10.0	9.92		ug/L		99	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*99*		*75 - 130*
4-Bromofluorobenzene (Surr)	*102*		*47 - 134*
Toluene-d8 (Surr)	*106*		*69 - 122*
Dibromofluoromethane (Surr)	*104*		*78 - 129*

Lab Sample ID: 240-144277-B-2 MS
Matrix: Water
Analysis Batch: 473047

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	67	U	667	598		ug/L		90	64 - 132
cis-1,2-Dichloroethene	1500		667	2140		ug/L		102	68 - 121
Tetrachloroethene	56	J	667	634		ug/L		87	52 - 129
Trichloroethene	1100		667	1670		ug/L		91	56 - 124
Vinyl chloride	160		667	734		ug/L		86	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*91*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*105*		*69 - 122*
Dibromofluoromethane (Surr)	*99*		*78 - 129*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144277-B-2 MSD
Matrix: Water
Analysis Batch: 473047

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	67	U	667	668		ug/L		100	64 - 132	11	35
cis-1,2-Dichloroethene	1500		667	2220		ug/L		113	68 - 121	3	35
Tetrachloroethene	56	J	667	730		ug/L		101	52 - 129	14	35
Trichloroethene	1100		667	1740		ug/L		101	56 - 124	4	35
Vinyl chloride	160		667	774		ug/L		92	49 - 136	5	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*90*		*47 - 134*
Toluene-d8 (Surr)	*99*		*69 - 122*
Dibromofluoromethane (Surr)	*99*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-472900/5
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 12:29	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/12/21 12:29*	*1*

Lab Sample ID: LCS 240-472900/4
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.6		ug/L		106	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144376-F-3 MS
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	10.8		ug/L		108	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144376-F-3 MSD
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.8		ug/L		108	46 - 170	1	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

GC/MS VOA

Analysis Batch: 472900

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144363-2	MW-92S_020921	Total/NA	Water	8260B SIM	
MB 240-472900/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-472900/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144376-F-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144376-F-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 473047

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144363-1	TRIP BLANK	Total/NA	Water	8260B	
240-144363-2	MW-92S_020921	Total/NA	Water	8260B	
MB 240-473047/6	Method Blank	Total/NA	Water	8260B	
LCS 240-473047/4	Lab Control Sample	Total/NA	Water	8260B	
240-144277-B-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144277-B-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144363-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144363-1

Date Collected: 02/09/21 00:00

Matrix: Water

Date Received: 02/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473047	02/15/21 16:51	LEE	TAL CAN

Client Sample ID: MW-92S_020921

Lab Sample ID: 240-144363-2

Date Collected: 02/09/21 13:19

Matrix: Water

Date Received: 02/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473047	02/15/21 17:14	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	472900	02/12/21 17:32	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144363-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

MICHIGAN 190

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Andrew Banitt		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

COC No:

of COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below: 10 day ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day

Sample Identification	Sample Date	Sample Time	Matrix: Air	Matrix: Aqueous	Matrix: Sediment	Matrix: Solid	Matrix: Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM					Sample Specific Notes / Special Instructions:
TRIP BLANK				1						1					N	G	X	X	X	X	X	X	X					Trip Blank
MW-925-020921	2/9/21	1319		6						6					N	G	X	X	X	X	X	X	X					3 VOAs for 8260B 3 VOAs for 8260B SIM

240-144363 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Andrew Banitt	Arcadis	2/9/21 1810	Novi cold storage	Arcadis	2/9/21 1810
Julia McClafferty	Arcadis	2/10/2021	Amanda Battenhill	ETA	2/10/21 10:12
Amanda Battenhill	ETA	2/10/21 1309	Received in Laboratory by: [signature]	ETA	2-11-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative Login # : 144363
Canton Facility

Client Arcadis Site Name

Cooler Received on 2-11-21 Opened on 2-11-21

Cooler unpacked by: Matt Snyder

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # VA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2.1 °C Corrected Cooler Temp. 2.2 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC907861
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 211701E	Yes	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

February 17, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144363-1
Sample date: 2021-02-09
Report received by CADENA: 2021-02-17
Initial Data Verification completed by CADENA: 2021-02-17
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144363-1

		Sample Name:	TRIP BLANK				MW-92S_020921			
		Lab Sample ID:	2401443631				2401443632			
		Sample Date:	2/9/2021				2/9/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS Design & Consultancy for natural and built assets

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

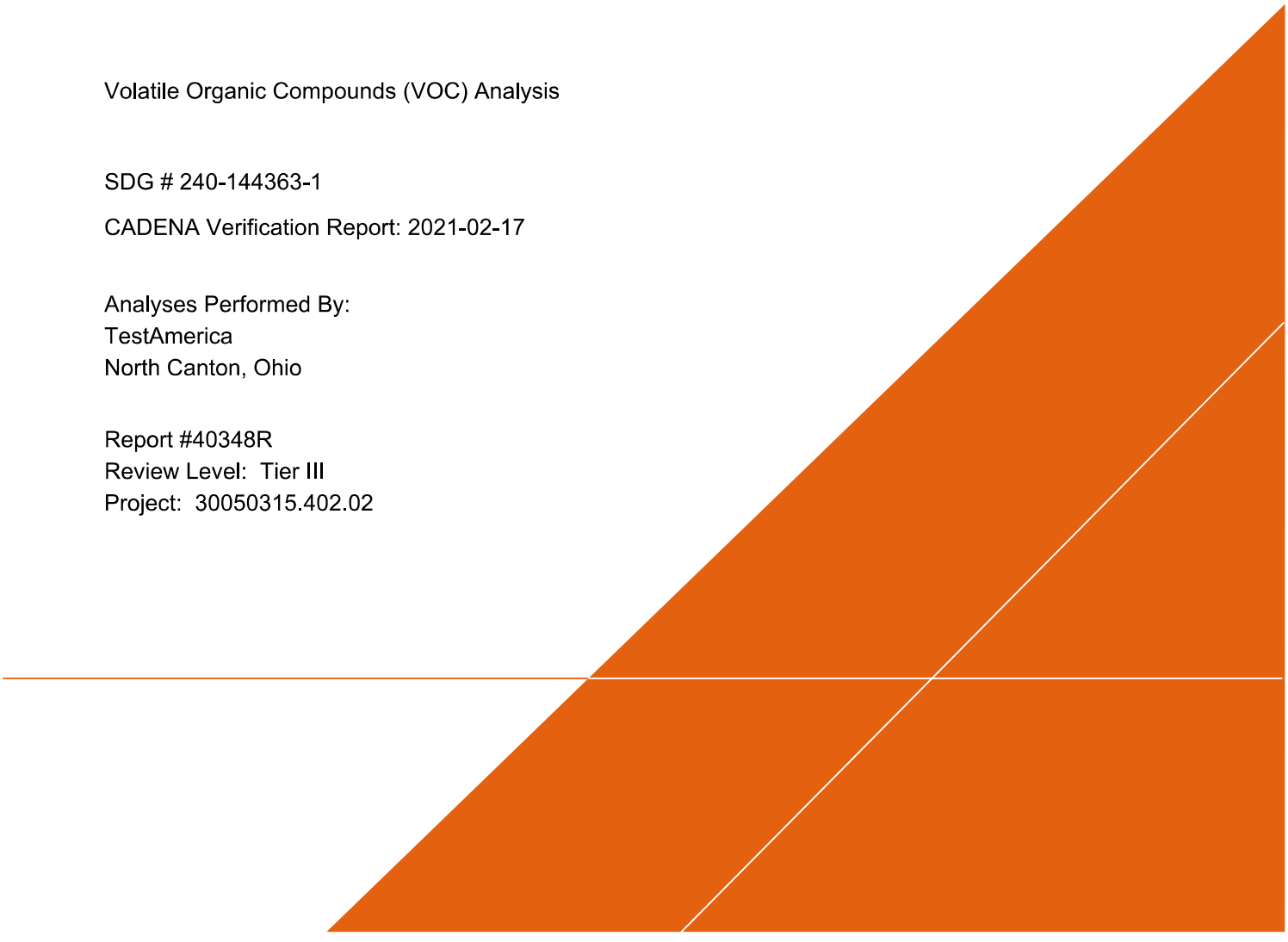
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144363-1

CADENA Verification Report: 2021-02-17

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report #40348R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144363-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					VOC
TRIP BLANK	240-144363-1	Water	02/09/2021		X
MW-92S_020921	240-144363-2	Water	02/09/2021		X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent

sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: February 23, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 05, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190 TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Andrew Bantz	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK				1						1					N	G	X	X	X	X	X	X	X	Trip Blank
MW-925-020921	2/9/21	1319		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260BSIM

240-144363 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company:	Date/Time:		Company:	Date/Time:
Relinquished by: Andrew Bantz	Arcadis	2/9/21 1810	Received by: Novi cold Storage	Arcadis	2/9/21 1810
Relinquished by: Julia McClafferty	Arcadis	2/10/2021	Received by: Amanda Battenhall	ETA	2/10/21 10:12
Relinquished by: Amanda Battenhall	ETA	2/10/21 1309	Received in Laboratory by:	ETA	2-11-21 800

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144363-1

Date Collected: 02/09/21 00:00
Matrix: Water
Date Received: 02/11/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 16:51	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 16:51	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 16:51	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 16:51	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 16:51	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 16:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*75 - 130*		*02/15/21 16:51*	*1*
4-Bromofluorobenzene (Surr)	*85*		*47 - 134*		*02/15/21 16:51*	*1*
Toluene-d8 (Surr)	*99*		*69 - 122*		*02/15/21 16:51*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*02/15/21 16:51*	*1*

Client Sample ID: MW-92S_020921
Lab Sample ID: 240-144363-2

Date Collected: 02/09/21 13:19
Matrix: Water
Date Received: 02/11/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 17:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*70 - 133*		*02/12/21 17:32*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 17:14	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 17:14	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 17:14	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 17:14	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 17:14	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 17:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*75 - 130*		*02/15/21 17:14*	*1*
4-Bromofluorobenzene (Surr)	*84*		*47 - 134*		*02/15/21 17:14*	*1*
Toluene-d8 (Surr)	*97*		*69 - 122*		*02/15/21 17:14*	*1*
Dibromofluoromethane (Surr)	*96*		*78 - 129*		*02/15/21 17:14*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144751-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/9/2021 9:59:32 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144751-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144751-1

Job ID: 240-144751-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144751-1

Comments
No additional comments.

Receipt
The samples were received on 2/23/2021 9:20 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.6º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144751-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144751-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144751-1	TRIP BLANK	Water	02/19/21 00:00	02/23/21 09:20	
240-144751-2	MW-111S_021921	Water	02/19/21 10:15	02/23/21 09:20	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144751-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144751-1

No Detections.

Client Sample ID: MW-111S_021921 — Lab Sample ID: 240-144751-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144751-1

Client Sample ID: TRIP BLANK
Date Collected: 02/19/21 00:00
Date Received: 02/23/21 09:20

Lab Sample ID: 240-144751-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 16:25	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 16:25	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 16:25	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 16:25	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 16:25	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 16:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*75 - 130*		*03/01/21 16:25*	*1*
4-Bromofluorobenzene (Surr)	*101*		*47 - 134*		*03/01/21 16:25*	*1*
Toluene-d8 (Surr)	*89*		*69 - 122*		*03/01/21 16:25*	*1*
Dibromofluoromethane (Surr)	*109*		*78 - 129*		*03/01/21 16:25*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144751-1

Client Sample ID: MW-111S_021921
Date Collected: 02/19/21 10:15
Date Received: 02/23/21 09:20

Lab Sample ID: 240-144751-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 17:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 133*		*02/26/21 17:09*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 16:49	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 16:49	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 16:49	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 16:49	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 16:49	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 16:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*75 - 130*		*03/01/21 16:49*	*1*
4-Bromofluorobenzene (Surr)	*101*		*47 - 134*		*03/01/21 16:49*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*03/01/21 16:49*	*1*
Dibromofluoromethane (Surr)	*107*		*78 - 129*		*03/01/21 16:49*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144751-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144751-1	TRIP BLANK	103	101	89	109
240-144751-2	MW-111S_021921	103	101	93	107
240-144754-B-2 MS	Matrix Spike	93	104	94	93
240-144754-B-2 MSD	Matrix Spike Duplicate	93	103	93	95
LCS 240-474864/5	Lab Control Sample	92	101	93	91
MB 240-474864/8	Method Blank	101	102	93	99

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144711-O-2 MS	Matrix Spike	85
240-144711-O-2 MSD	Matrix Spike Duplicate	86
240-144751-2	MW-111S_021921	88
LCS 240-474631/4	Lab Control Sample	82
MB 240-474631/5	Method Blank	80

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474864/8
Matrix: Water
Analysis Batch: 474864

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 13:08	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 13:08	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 13:08	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 13:08	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 13:08	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 13:08	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*03/01/21 13:08*	*1*
4-Bromofluorobenzene (Surr)	*102*		*47 - 134*		*03/01/21 13:08*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*03/01/21 13:08*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*03/01/21 13:08*	*1*

Lab Sample ID: LCS 240-474864/5
Matrix: Water
Analysis Batch: 474864

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	20.0	20.5		ug/L		103	73 - 129
cis-1,2-Dichloroethene	20.0	20.9		ug/L		104	75 - 124
Tetrachloroethene	20.0	20.8		ug/L		104	70 - 125
trans-1,2-Dichloroethene	20.0	20.5		ug/L		102	74 - 130
Trichloroethene	20.0	19.8		ug/L		99	71 - 121
Vinyl chloride	20.0	23.6		ug/L		118	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*
4-Bromofluorobenzene (Surr)	*101*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*91*		*78 - 129*

Lab Sample ID: 240-144754-B-2 MS
Matrix: Water
Analysis Batch: 474864

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	500	U	10000	9650		ug/L		96	64 - 132
Tetrachloroethene	500	U	10000	9480		ug/L		95	52 - 129
trans-1,2-Dichloroethene	210	J	10000	9670		ug/L		95	69 - 126
Trichloroethene	500	U	10000	9110		ug/L		91	56 - 124
Vinyl chloride	12000		10000	22900		ug/L		111	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*104*		*47 - 134*
Toluene-d8 (Surr)	*94*		*69 - 122*
Dibromofluoromethane (Surr)	*93*		*78 - 129*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144754-B-2 MSD
Matrix: Water
Analysis Batch: 474864

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	500	U	10000	10800		ug/L		108	64 - 132	11	35
Tetrachloroethene	500	U	10000	10200		ug/L		102	52 - 129	7	35
trans-1,2-Dichloroethene	210	J	10000	10800		ug/L		106	69 - 126	11	35
Trichloroethene	500	U	10000	9990		ug/L		100	56 - 124	9	35
Vinyl chloride	12000		10000	25200		ug/L		134	49 - 136	9	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*95*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474631/5
Matrix: Water
Analysis Batch: 474631

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 10:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/26/21 10:51*	*1*

Lab Sample ID: LCS 240-474631/4
Matrix: Water
Analysis Batch: 474631

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	9.80		ug/L		98	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144711-O-2 MS
Matrix: Water
Analysis Batch: 474631

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	9.26		ug/L		93	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*70 - 133*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144711-O-2 MSD
Matrix: Water
Analysis Batch: 474631

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.91		ug/L		99	46 - 170	7	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144751-1

GC/MS VOA

Analysis Batch: 474631

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144751-2	MW-111S_021921	Total/NA	Water	8260B SIM	
MB 240-474631/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474631/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144711-O-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144711-O-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474864

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144751-1	TRIP BLANK	Total/NA	Water	8260B	
240-144751-2	MW-111S_021921	Total/NA	Water	8260B	
MB 240-474864/8	Method Blank	Total/NA	Water	8260B	
LCS 240-474864/5	Lab Control Sample	Total/NA	Water	8260B	
240-144754-B-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144754-B-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144751-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144751-1

Date Collected: 02/19/21 00:00

Matrix: Water

Date Received: 02/23/21 09:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474864	03/01/21 16:25	HMB	TAL CAN

Client Sample ID: MW-111S_021921

Lab Sample ID: 240-144751-2

Date Collected: 02/19/21 10:15

Matrix: Water

Date Received: 02/23/21 09:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474864	03/01/21 16:49	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		1	474631	02/26/21 17:09	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144751-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

MICHIGAN TestAmerica 190 — THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Allyson Hartz	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day — 10 day		Walk-in client:
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 trip blank
MW-1115_021921	2/19/21	10:15		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-144751 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	2/19/21 14:30	Nalcold storage	Arcadis	2/19/21 14:30
[signature]	Arcadis	2/22/2021	[signature]	ETA	2/22/21 10:05
[signature]	ETA	2/22/21 11:19	Received in Laboratory by: [signature]	TA	2-23-21 920

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 144751
Canton Facility

Client Arcadis Site Name

Cooler unpacked by:

Cooler Received on 2-23-21 Opened on 2-23-21

FedEx: 1st (Grd) Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2-5 °C Corrected Cooler Temp. 2-6 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC907861
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #	Yes	No
17. Was a LL Hg or Me Hg trip blank present?	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container.
Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.
Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

DATA VERIFICATION REPORT

March 09, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144751-1
Sample date: 2021-02-19
Report received by CADENA: 2021-03-09
Initial Data Verification completed by CADENA: 2021-03-09
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144751-1

		Sample Name:	TRIP BLANK				MW-111S_021921			
		Lab Sample ID:	2401447511				2401447512			
		Sample Date:	2/19/2021				2/19/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

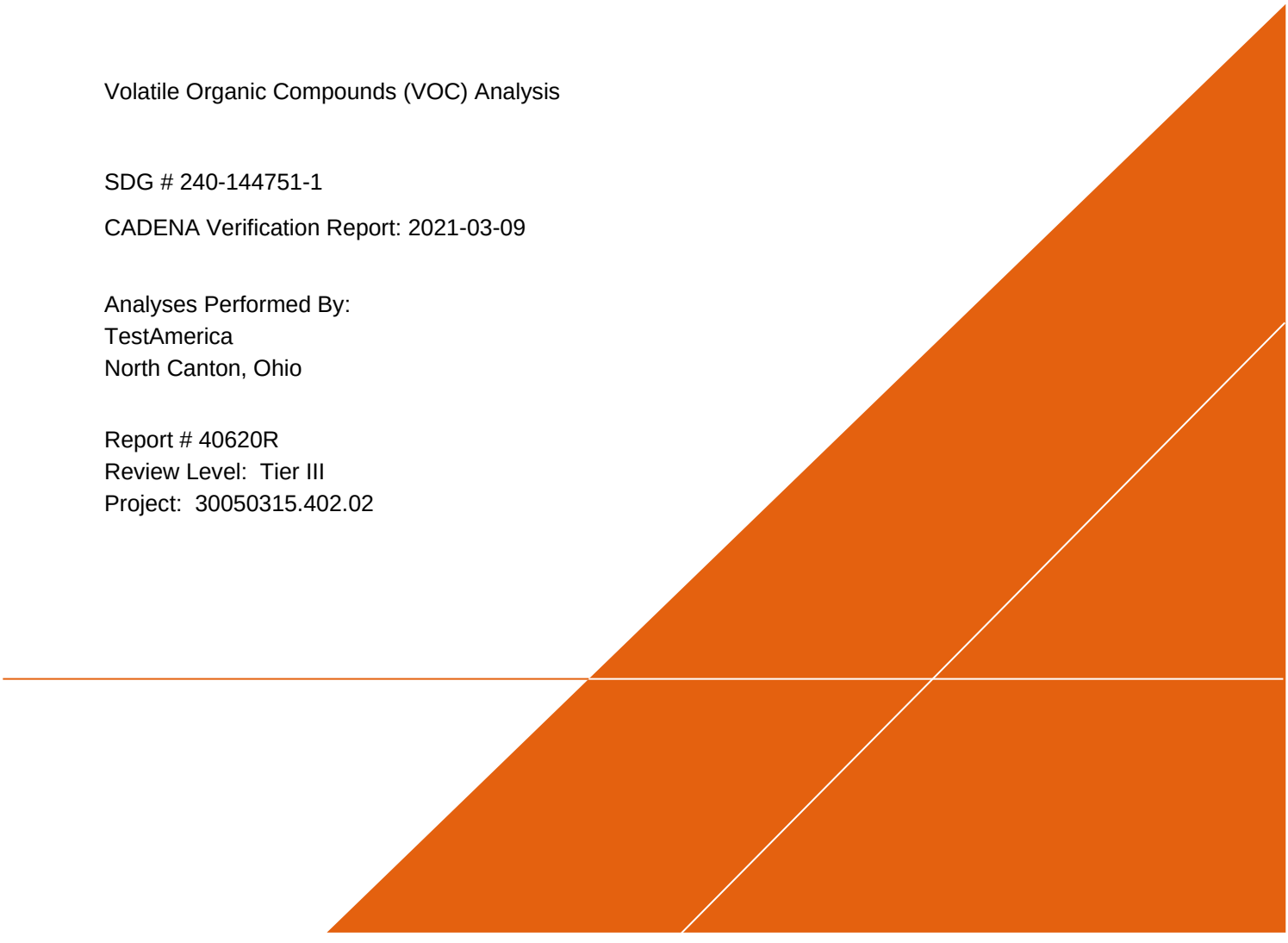
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144751-1

CADENA Verification Report: 2021-03-09

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40620R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144751-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144751-1	Water	02/19/2021		X	
MW-111S_021921	240-144751-2	Water	02/19/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

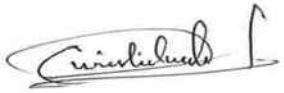
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 18, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 18, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190 TestAmerica — THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Allyson Hartz	TAT if different from below: 10 day; ☑ 2 weeks; 3 weeks; 1 week; 2 days; 1 day		Walk-in client; Lab sampling
Phone: 248-994-2240	Method of Shipment/Carrier:			
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM					Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	✓					1 trip blank
MW-1115_021921	2/19/21	10:15		6						6					N	G	X	X	X	X	X	X	✓					3 VOAs for 8260B 3 VOAs for 8260B SIM

240-144751 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	2/19/21 14:30	Ngl cold storage	Arcadis	2/19/21 14:30
[signature]	Arcadis	2/22/2021	[signature]	ETA	2/22/21 10:05
[signature]	ETA	2/22/21 11:19	Received in Laboratory by: [signature]	TA	2-23-21 920

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144751-1
Date Collected: 02/19/21 00:00
Matrix: Water
Date Received: 02/23/21 09:20

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 16:25	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 16:25	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 16:25	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 16:25	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 16:25	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 16:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*75 - 130*		*03/01/21 16:25*	*1*
4-Bromofluorobenzene (Surr)	*101*		*47 - 134*		*03/01/21 16:25*	*1*
Toluene-d8 (Surr)	*89*		*69 - 122*		*03/01/21 16:25*	*1*
Dibromofluoromethane (Surr)	*109*		*78 - 129*		*03/01/21 16:25*	*1*

Client Sample ID: MW-111S_021921
Lab Sample ID: 240-144751-2
Date Collected: 02/19/21 10:15
Matrix: Water
Date Received: 02/23/21 09:20

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 17:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 133*		*02/26/21 17:09*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 16:49	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 16:49	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 16:49	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 16:49	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 16:49	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 16:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*75 - 130*		*03/01/21 16:49*	*1*
4-Bromofluorobenzene (Surr)	*101*		*47 - 134*		*03/01/21 16:49*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*03/01/21 16:49*	*1*
Dibromofluoromethane (Surr)	*107*		*78 - 129*		*03/01/21 16:49*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144573-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
2/28/2021 2:04:44 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at:
www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144573-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144573-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144573-1

Comments
No additional comments.

Receipt
The samples were received on 2/17/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.1° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144573-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144573-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144573-1	TRIP BLANK	Water	02/12/21 00:00	02/17/21 08:00	
240-144573-2	MW-155S_021221	Water	02/12/21 17:10	02/17/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144573-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144573-1

No Detections.

Client Sample ID: MW-155S_021221 — Lab Sample ID: 240-144573-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144573-1

Client Sample ID: TRIP BLANK
Date Collected: 02/12/21 00:00
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144573-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 15:15	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/23/21 15:15	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 15:15	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 15:15	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/23/21 15:15	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/23/21 15:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*02/23/21 15:15*	*1*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*		*02/23/21 15:15*	*1*
Toluene-d8 (Surr)	*100*		*69 - 122*		*02/23/21 15:15*	*1*
Dibromofluoromethane (Surr)	*100*		*78 - 129*		*02/23/21 15:15*	*1*

Client Sample ID: MW-155S_021221
Date Collected: 02/12/21 17:10
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144573-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 18:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/22/21 18:42*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 15:37	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/23/21 15:37	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 15:37	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 15:37	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/23/21 15:37	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/23/21 15:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*75 - 130*		*02/23/21 15:37*	*1*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*		*02/23/21 15:37*	*1*
Toluene-d8 (Surr)	*99*		*69 - 122*		*02/23/21 15:37*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*02/23/21 15:37*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144573-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144573-1	TRIP BLANK	100	87	100	100
240-144573-2	MW-155S_021221	99	91	99	98
240-144576-D-2 MS	Matrix Spike	97	96	103	97
240-144576-E-2 MSD	Matrix Spike Duplicate	95	93	98	97
LCS 240-474092/4	Lab Control Sample	101	103	105	109
MB 240-474092/6	Method Blank	98	87	101	98

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144573-2	MW-155S_021221	82
240-144576-G-2 MS	Matrix Spike	81
240-144576-G-2 MSD	Matrix Spike Duplicate	81
LCS 240-473970/4	Lab Control Sample	80
MB 240-473970/5	Method Blank	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474092/6
Matrix: Water
Analysis Batch: 474092

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 11:10	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/23/21 11:10	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 11:10	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 11:10	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/23/21 11:10	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/23/21 11:10	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 130*		*02/23/21 11:10*	*1*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*		*02/23/21 11:10*	*1*
Toluene-d8 (Surr)	*101*		*69 - 122*		*02/23/21 11:10*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*02/23/21 11:10*	*1*

Lab Sample ID: LCS 240-474092/4
Matrix: Water
Analysis Batch: 474092

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.9		ug/L		109	73 - 129
cis-1,2-Dichloroethene	10.0	10.8		ug/L		108	75 - 124
Tetrachloroethene	10.0	11.7		ug/L		117	70 - 125
trans-1,2-Dichloroethene	10.0	10.6		ug/L		106	74 - 130
Trichloroethene	10.0	10.4		ug/L		104	71 - 121
Vinyl chloride	10.0	11.4		ug/L		114	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*
Toluene-d8 (Surr)	*105*		*69 - 122*
Dibromofluoromethane (Surr)	*109*		*78 - 129*

Lab Sample ID: 240-144576-D-2 MS
Matrix: Water
Analysis Batch: 474092

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.00		ug/L		90	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	9.45		ug/L		95	68 - 121
Tetrachloroethene	1.0	U	10.0	8.55		ug/L		85	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.17		ug/L		92	69 - 126
Trichloroethene	1.0	U	10.0	9.03		ug/L		90	56 - 124
Vinyl chloride	1.0	U	10.0	9.58		ug/L		96	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*
Toluene-d8 (Surr)	*103*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144576-D-2 MS
Matrix: Water
Analysis Batch: 474092

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*97*		*78 - 129*

Lab Sample ID: 240-144576-E-2 MSD
Matrix: Water
Analysis Batch: 474092

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.58		ug/L		96	64 - 132	6	35
cis-1,2-Dichloroethene	1.0	U	10.0	9.91		ug/L		99	68 - 121	5	35
Tetrachloroethene	1.0	U	10.0	10.1		ug/L		101	52 - 129	17	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.82		ug/L		98	69 - 126	7	35
Trichloroethene	1.0	U	10.0	10.2		ug/L		102	56 - 124	12	35
Vinyl chloride	1.0	U	10.0	10.5		ug/L		105	49 - 136	9	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*95*		*75 - 130*
4-Bromofluorobenzene (Surr)	*93*		*47 - 134*
Toluene-d8 (Surr)	*98*		*69 - 122*
Dibromofluoromethane (Surr)	*97*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473970/5
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 14:03	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/22/21 14:03*	*1*

Lab Sample ID: LCS 240-473970/4
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.3		ug/L		103	80 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*

Lab Sample ID: 240-144576-G-2 MS
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	10.7		ug/L		107	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

Lab Sample ID: 240-144576-G-2 MSD
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	11.1		ug/L		111	46 - 170	4	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

GC/MS VOA

Analysis Batch: 473970

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144573-2	MW-155S_021221	Total/NA	Water	8260B SIM	
MB 240-473970/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-473970/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144576-G-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144576-G-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474092

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144573-1	TRIP BLANK	Total/NA	Water	8260B	
240-144573-2	MW-155S_021221	Total/NA	Water	8260B	
MB 240-474092/6	Method Blank	Total/NA	Water	8260B	
LCS 240-474092/4	Lab Control Sample	Total/NA	Water	8260B	
240-144576-D-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144576-E-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144573-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144573-1

Date Collected: 02/12/21 00:00

Matrix: Water

Date Received: 02/17/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474092	02/23/21 15:15	LEE	TAL CAN

Client Sample ID: MW-155S_021221

Lab Sample ID: 240-144573-2

Date Collected: 02/12/21 17:10

Matrix: Water

Date Received: 02/17/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474092	02/23/21 15:37	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	473970	02/22/21 18:42	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144573-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190

TestAmerica

Client Contact	Regulatory program: DW NPDES RCRA Other			TestAmerica Laboratories, Inc.
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Andrew Banitt	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Matrix: Aqueous	Matrix: Sediment	Matrix: Solid	Matrix: Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	2/12/21	—		1						1					N	G	X	X	X	X	X	X	X	Trip Blank
MW-1555_021221	2/12/21	1710		6						6					N	G	X	X	X	X	X	X	X	3 VOAs method 8260B 3 VOAs method 8260B SIM

240-144573 Chain of Custody

Possible Hazard Identification: Non-Hazard, Flammable, Skin Irritant, Poison B, Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client, Disposal By Lab, Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Andrew Banitt	Arcadis	2/12/21 1820	Novi Cold storage	Arcadis	2/12/21 1820
Christopher [illegible]	ARCADIS	2/15/21 / 1010	Amanda Battershell	ARCADIS	2/15/21 / 1010
Amanda Battershell	ETA	2/15/21 10:57	Received in Laboratory by:	Company:	Date/Time:

COLD STORAGE ETA 2/15/21 10:57

Amanda Battershell ETA 2/16/21 907 ~~[illegible]~~ ETA 2-17-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative Login # : 144573
Canton Facility

Client Arcadis Site Name

Cooler Received on 2-17-21 Opened on 2-17-21

Cooler unpacked by: MattSnyder

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form

IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 4.6 °C Corrected Cooler Temp. 4.7 °C

IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity ____	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	(Yes)	No
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?	(Y)	(Y) (Y)
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ____	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes	(No)

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.

Sample(s) ____ were received in a broken container.

Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.

Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

February 28, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144573-1
Sample date: 2021-02-12
Report received by CADENA: 2021-02-28
Initial Data Verification completed by CADENA: 2021-02-28
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144573-1

		Sample Name:	TRIP BLANK				MW-155S_021221			
		Lab Sample ID:	2401445731				2401445732			
		Sample Date:	2/12/2021				2/12/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

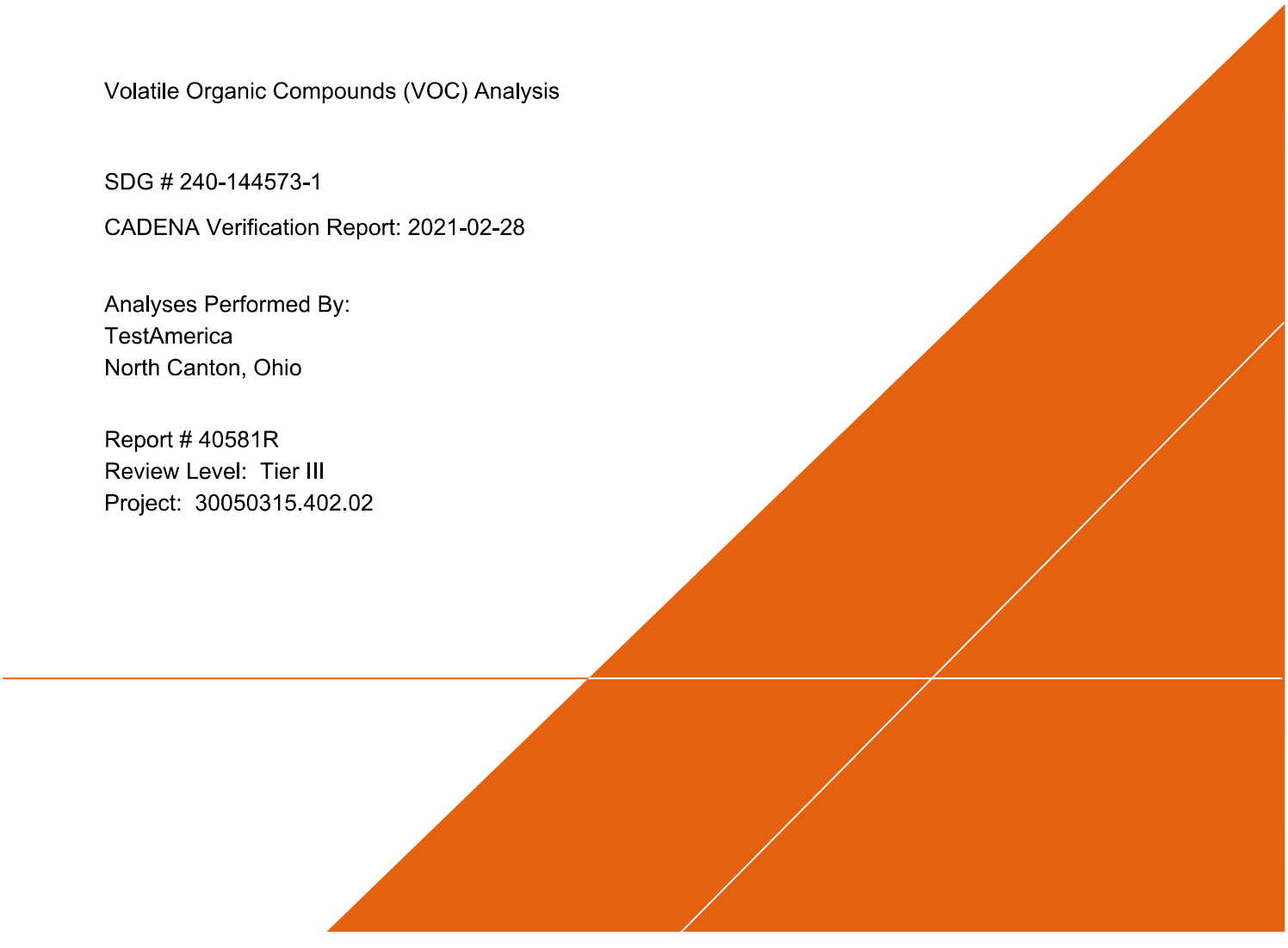
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144573-1

CADENA Verification Report: 2021-02-28

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40581R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144573-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144573-1	Water	02/12/2021		X	
MW-155S_021221	240-144573-2	Water	02/12/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 17, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 18, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica MICHIGAN 190

TestAmerica Laboratories, Inc.

Regulatory program: DW NPDES RCRA Other

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	
Phone: 248-994-2240	Sampler Name: Andrew Banitt	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day	
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

COC No: 1 of 1 COCs

For lab use only: Walk-in client; Lab sampling; Job/SDG No:

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: HNO3	HCl	NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	2/12/21	—		1					1				N	G	X	X	X	X	X	X	X	Trip Blank
MW-1555_021221	2/12/21	1710		6					6				N	G	X	X	X	X	X	X	X	3 VOAs method 8260B; 3 VOAs method 8260B SIM

240-144573 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by: Andrew Banitt	Company: Arcadis	Date/Time: 2/12/21 1820	Received by: Novi Cold Storage	Company: Arcadis	Date/Time: 2/12/21 1820
Relinquished by: Christopher Ellen	Company: ARCADIS	Date/Time: 2/15/21 1010	Received by: Amanda Battershell	Company: ARCADIS	Date/Time: 2/15/21 1010
Relinquished by: Amanda Battershell	Company: ETA	Date/Time: 2/15/21 10:57	Received in Laboratory by:	Company:	Date/Time:

COLD STORAGE ETA 2/15/21 10:57

Amanda Battershell ETA 2/16/21 907 ~~Mattie~~ ETA 2-17-21 800

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144573-1

Date Collected: 02/12/21 00:00
Matrix: Water
Date Received: 02/17/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 15:15	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/23/21 15:15	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 15:15	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 15:15	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/23/21 15:15	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/23/21 15:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*02/23/21 15:15*	*1*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*		*02/23/21 15:15*	*1*
Toluene-d8 (Surr)	*100*		*69 - 122*		*02/23/21 15:15*	*1*
Dibromofluoromethane (Surr)	*100*		*78 - 129*		*02/23/21 15:15*	*1*

Client Sample ID: MW-155S_021221
Lab Sample ID: 240-144573-2

Date Collected: 02/12/21 17:10
Matrix: Water
Date Received: 02/17/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 18:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/22/21 18:42*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 15:37	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/23/21 15:37	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 15:37	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 15:37	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/23/21 15:37	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/23/21 15:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*75 - 130*		*02/23/21 15:37*	*1*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*		*02/23/21 15:37*	*1*
Toluene-d8 (Surr)	*99*		*69 - 122*		*02/23/21 15:37*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*02/23/21 15:37*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144571-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
2/28/2021 2:00:48 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

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Visit us at:
www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144571-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144571-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144571-1

Comments
No additional comments.

Receipt
The samples were received on 2/17/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.5° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144571-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144571-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144571-1	TRIP BLANK	Water	02/12/21 00:00	02/17/21 08:00	
240-144571-2	MW-157S_021221	Water	02/12/21 16:00	02/17/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144571-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144571-1

No Detections.

Client Sample ID: MW-157S_021221 — Lab Sample ID: 240-144571-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144571-1

Client Sample ID: TRIP BLANK

Date Collected: 02/12/21 00:00
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144571-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 14:30	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/23/21 14:30	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 14:30	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 14:30	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/23/21 14:30	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/23/21 14:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*02/23/21 14:30*	*1*
4-Bromofluorobenzene (Surr)	*92*		*47 - 134*		*02/23/21 14:30*	*1*
Toluene-d8 (Surr)	*99*		*69 - 122*		*02/23/21 14:30*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*02/23/21 14:30*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144571-1

Client Sample ID: MW-157S_021221

Date Collected: 02/12/21 16:00
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144571-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 18:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/22/21 18:17*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 14:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/23/21 14:52	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 14:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 14:52	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/23/21 14:52	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/23/21 14:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*75 - 130*		*02/23/21 14:52*	*1*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*		*02/23/21 14:52*	*1*
Toluene-d8 (Surr)	*101*		*69 - 122*		*02/23/21 14:52*	*1*
Dibromofluoromethane (Surr)	*101*		*78 - 129*		*02/23/21 14:52*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144571-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144571-1	TRIP BLANK	100	92	99	98
240-144571-2	MW-157S_021221	103	89	101	101
240-144576-D-2 MS	Matrix Spike	97	96	103	97
240-144576-E-2 MSD	Matrix Spike Duplicate	95	93	98	97
LCS 240-474092/4	Lab Control Sample	101	103	105	109
MB 240-474092/6	Method Blank	98	87	101	98

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144571-2	MW-157S_021221	83
240-144576-G-2 MS	Matrix Spike	81
240-144576-G-2 MSD	Matrix Spike Duplicate	81
LCS 240-473970/4	Lab Control Sample	80
MB 240-473970/5	Method Blank	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474092/6
Matrix: Water
Analysis Batch: 474092

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 11:10	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/23/21 11:10	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 11:10	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 11:10	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/23/21 11:10	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/23/21 11:10	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 130*		*02/23/21 11:10*	*1*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*		*02/23/21 11:10*	*1*
Toluene-d8 (Surr)	*101*		*69 - 122*		*02/23/21 11:10*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*02/23/21 11:10*	*1*

Lab Sample ID: LCS 240-474092/4
Matrix: Water
Analysis Batch: 474092

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.9		ug/L		109	73 - 129
cis-1,2-Dichloroethene	10.0	10.8		ug/L		108	75 - 124
Tetrachloroethene	10.0	11.7		ug/L		117	70 - 125
trans-1,2-Dichloroethene	10.0	10.6		ug/L		106	74 - 130
Trichloroethene	10.0	10.4		ug/L		104	71 - 121
Vinyl chloride	10.0	11.4		ug/L		114	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*
Toluene-d8 (Surr)	*105*		*69 - 122*
Dibromofluoromethane (Surr)	*109*		*78 - 129*

Lab Sample ID: 240-144576-D-2 MS
Matrix: Water
Analysis Batch: 474092

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.00		ug/L		90	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	9.45		ug/L		95	68 - 121
Tetrachloroethene	1.0	U	10.0	8.55		ug/L		85	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.17		ug/L		92	69 - 126
Trichloroethene	1.0	U	10.0	9.03		ug/L		90	56 - 124
Vinyl chloride	1.0	U	10.0	9.58		ug/L		96	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*
Toluene-d8 (Surr)	*103*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144576-D-2 MS
Matrix: Water
Analysis Batch: 474092

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*97*		*78 - 129*

Lab Sample ID: 240-144576-E-2 MSD
Matrix: Water
Analysis Batch: 474092

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.58		ug/L		96	64 - 132	6	35
cis-1,2-Dichloroethene	1.0	U	10.0	9.91		ug/L		99	68 - 121	5	35
Tetrachloroethene	1.0	U	10.0	10.1		ug/L		101	52 - 129	17	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.82		ug/L		98	69 - 126	7	35
Trichloroethene	1.0	U	10.0	10.2		ug/L		102	56 - 124	12	35
Vinyl chloride	1.0	U	10.0	10.5		ug/L		105	49 - 136	9	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*95*		*75 - 130*
4-Bromofluorobenzene (Surr)	*93*		*47 - 134*
Toluene-d8 (Surr)	*98*		*69 - 122*
Dibromofluoromethane (Surr)	*97*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473970/5
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 14:03	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/22/21 14:03*	*1*

Lab Sample ID: LCS 240-473970/4
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.3		ug/L		103	80 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*

Lab Sample ID: 240-144576-G-2 MS
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	10.7		ug/L		107	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

Lab Sample ID: 240-144576-G-2 MSD
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	11.1		ug/L		111	46 - 170	4	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

GC/MS VOA

Analysis Batch: 473970

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144571-2	MW-157S_021221	Total/NA	Water	8260B SIM	
MB 240-473970/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-473970/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144576-G-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144576-G-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474092

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144571-1	TRIP BLANK	Total/NA	Water	8260B	
240-144571-2	MW-157S_021221	Total/NA	Water	8260B	
MB 240-474092/6	Method Blank	Total/NA	Water	8260B	
LCS 240-474092/4	Lab Control Sample	Total/NA	Water	8260B	
240-144576-D-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144576-E-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144571-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144571-1

Date Collected: 02/12/21 00:00

Matrix: Water

Date Received: 02/17/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474092	02/23/21 14:30	LEE	TAL CAN

Client Sample ID: MW-157S_021221

Lab Sample ID: 240-144571-2

Date Collected: 02/12/21 16:00

Matrix: Water

Date Received: 02/17/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474092	02/23/21 14:52	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	473970	02/22/21 18:17	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144571-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

MICHIGAN 190 TestAmerica

Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Emma Witherspoon		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

COC No: (of) COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below: 10 day — 3 weeks, 2 weeks, 1 week, 2 days, 1 day

Analyses

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM					Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X					1 Trip blank
MW-1575_021221	2/12/21	1600		6						6					N	G	X	X	X	X	X	X	X					3 VOAs for 8260B 3 VOAs for 8260B SIM

240-144571 Chain of Custody

Possible Hazard Identification: Non-Hazard, Flammable, Skin Irritant, Poison B, Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client, Disposal By Lab, Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
E Witherspoon	Arcadis	2/12/21 / 1700	Arcadis Cold Storage	Arcadis	2/12/21 / 1700
Christin Ulm	ARCADIS	2/15/21 / 1010	Amanda Battishill	ETA	2/15/21 / 1010
Amanda Battishill	ETA	2/15/21 10:57	Received in Laboratory by:	Company:	Date/Time:

COLD STORAGE ETA 2/15/21 10:57

Amanda Battishill ETA 2/16/21 907 [signature] ETA 2-17-21 800

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2/28/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 144571
Canton Facility

Client Arcadis Site Name

Cooler Received on 2-17-21 Opened on 2-17-21

Cooler unpacked by: MattSnyder

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 0.4 °C Corrected Cooler Temp 0.5 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity____	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	(Yes)	No
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #____	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

February 28, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144571-1
Sample date: 2021-02-12
Report received by CADENA: 2021-02-28
Initial Data Verification completed by CADENA: 2021-02-28
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144571-1

		Sample Name:	TRIP BLANK				MW-157S_021221			
		Lab Sample ID:	2401445711				2401445712			
		Sample Date:	2/12/2021				2/12/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

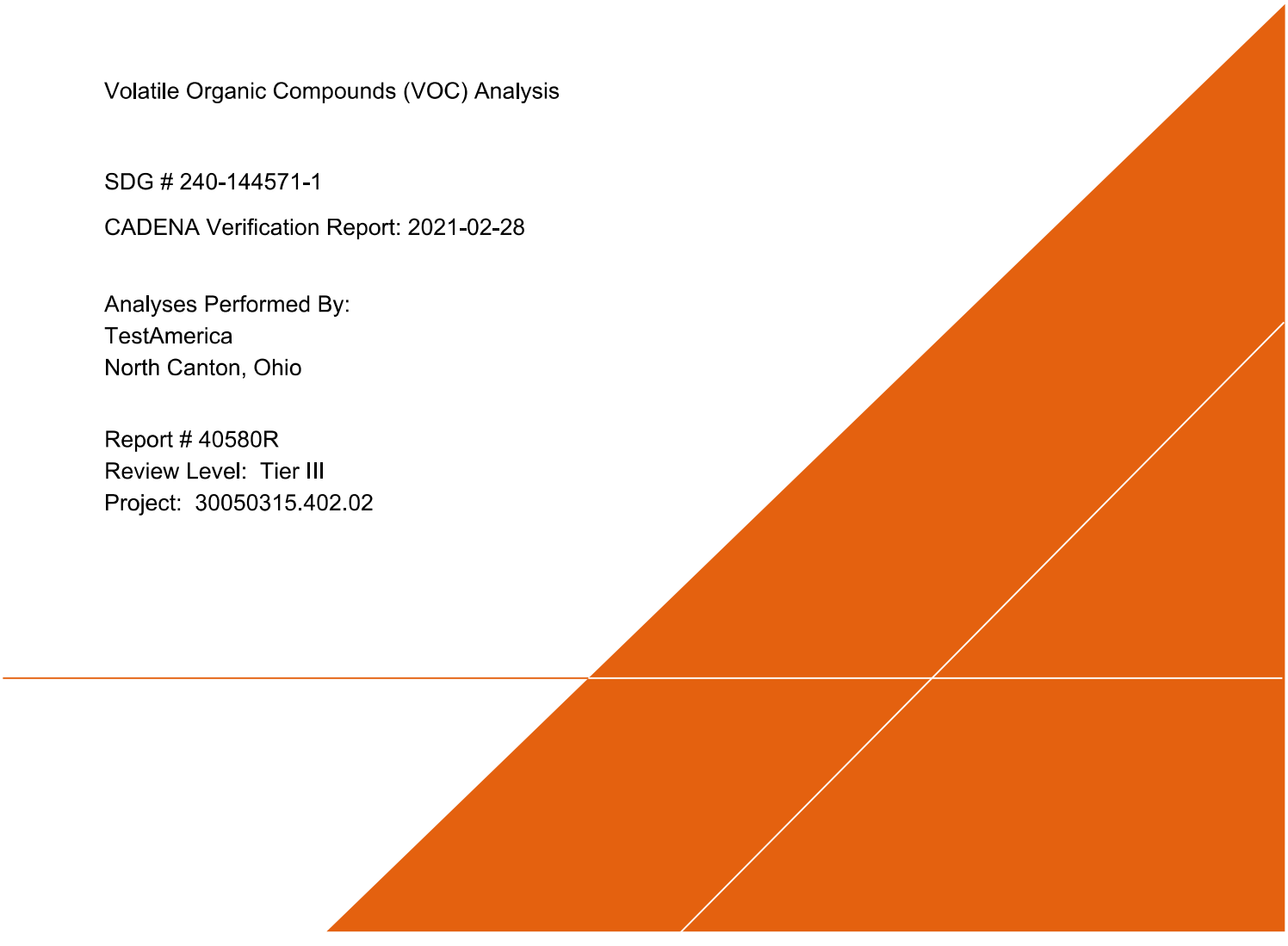
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144571-1

CADENA Verification Report: 2021-02-28

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40580R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144571-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144571-1	Water	02/12/2021		X	
MW-157S_021221	240-144571-2	Water	02/12/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 17, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 18, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190 TestAmerica

Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Client Contact	Regulatory program: DW NPDES RCRA Other			TestAmerica Laboratories, Inc.
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; 3 weeks; 2 weeks; 1 week; 2 days; 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-157S_021221	2/12/21	1600		6						6					N	G	X	X	X	X	X	X	X	3 vocs for 8260B; 3 vocs for 8260B SIM

240-144571 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
E Witherspoon	Arcadis	2/12/21 / 1700	Arcadis Cold Storage	Arcadis	2/12/21 / 1700
Christin Ulm	ARCADIS	2/15/21 / 1010	Amanda Battishill	ETA	2/15/21 / 1010
Amanda Battishill	ETA	2/15/21 10:57	Received in Laboratory by:	Company:	Date/Time:

COLD STORAGE ETA 2/15/21 10:57

Amanda Battishill ETA 2/16/21 907 [signature] ETA 2-17-21 800

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02/28/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144571-1

Date Collected: 02/12/21 00:00
Matrix: Water
Date Received: 02/17/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 14:30	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/23/21 14:30	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 14:30	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 14:30	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/23/21 14:30	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/23/21 14:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*02/23/21 14:30*	*1*
4-Bromofluorobenzene (Surr)	*92*		*47 - 134*		*02/23/21 14:30*	*1*
Toluene-d8 (Surr)	*99*		*69 - 122*		*02/23/21 14:30*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*02/23/21 14:30*	*1*

Client Sample ID: MW-157S_021221
Lab Sample ID: 240-144571-2

Date Collected: 02/12/21 16:00
Matrix: Water
Date Received: 02/17/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 18:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/22/21 18:17*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 14:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/23/21 14:52	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 14:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 14:52	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/23/21 14:52	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/23/21 14:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*75 - 130*		*02/23/21 14:52*	*1*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*		*02/23/21 14:52*	*1*
Toluene-d8 (Surr)	*101*		*69 - 122*		*02/23/21 14:52*	*1*
Dibromofluoromethane (Surr)	*101*		*78 - 129*		*02/23/21 14:52*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144749-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/9/2021 9:57:04 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
Review your project results through TotalAccess
Have a Question? Ask The Expert
Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144749-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144749-1

Job ID: 240-144749-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144749-1

Comments
No additional comments.

Receipt
The samples were received on 2/23/2021 9:20 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.6º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144749-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144749-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144749-1	TRIP BLANK	Water	02/19/21 00:00	02/23/21 09:20	
240-144749-2	MW-143S_021921	Water	02/19/21 13:00	02/23/21 09:20	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144749-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144749-1

No Detections.

Client Sample ID: MW-143S_021921 — Lab Sample ID: 240-144749-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144749-1

Client Sample ID: TRIP BLANK

Date Collected: 02/19/21 00:00
Date Received: 02/23/21 09:20

Lab Sample ID: 240-144749-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 14:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 14:46	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 14:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 14:46	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 14:46	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 14:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*03/01/21 14:46*	*1*
4-Bromofluorobenzene (Surr)	*104*		*47 - 134*		*03/01/21 14:46*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*03/01/21 14:46*	*1*
Dibromofluoromethane (Surr)	*107*		*78 - 129*		*03/01/21 14:46*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144749-1

Client Sample ID: MW-143S_021921
Date Collected: 02/19/21 13:00
Date Received: 02/23/21 09:20

Lab Sample ID: 240-144749-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 16:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*70 - 133*		*02/26/21 16:19*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 15:11	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 15:11	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 15:11	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 15:11	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 15:11	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 15:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*75 - 130*		*03/01/21 15:11*	*1*
4-Bromofluorobenzene (Surr)	*101*		*47 - 134*		*03/01/21 15:11*	*1*
Toluene-d8 (Surr)	*91*		*69 - 122*		*03/01/21 15:11*	*1*
Dibromofluoromethane (Surr)	*110*		*78 - 129*		*03/01/21 15:11*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144749-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144749-1	TRIP BLANK	104	104	90	107
240-144749-2	MW-143S_021921	105	101	91	110
240-144754-B-2 MS	Matrix Spike	93	104	94	93
240-144754-B-2 MSD	Matrix Spike Duplicate	93	103	93	95
LCS 240-474864/5	Lab Control Sample	92	101	93	91
MB 240-474864/8	Method Blank	101	102	93	99

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144711-O-2 MS	Matrix Spike	85
240-144711-O-2 MSD	Matrix Spike Duplicate	86
240-144749-2	MW-143S_021921	87
LCS 240-474631/4	Lab Control Sample	82
MB 240-474631/5	Method Blank	80

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474864/8
Matrix: Water
Analysis Batch: 474864

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 13:08	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 13:08	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 13:08	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 13:08	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 13:08	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 13:08	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*03/01/21 13:08*	*1*
4-Bromofluorobenzene (Surr)	*102*		*47 - 134*		*03/01/21 13:08*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*03/01/21 13:08*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*03/01/21 13:08*	*1*

Lab Sample ID: LCS 240-474864/5
Matrix: Water
Analysis Batch: 474864

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	20.0	20.5		ug/L		103	73 - 129
cis-1,2-Dichloroethene	20.0	20.9		ug/L		104	75 - 124
Tetrachloroethene	20.0	20.8		ug/L		104	70 - 125
trans-1,2-Dichloroethene	20.0	20.5		ug/L		102	74 - 130
Trichloroethene	20.0	19.8		ug/L		99	71 - 121
Vinyl chloride	20.0	23.6		ug/L		118	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*
4-Bromofluorobenzene (Surr)	*101*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*91*		*78 - 129*

Lab Sample ID: 240-144754-B-2 MS
Matrix: Water
Analysis Batch: 474864

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	500	U	10000	9650		ug/L		96	64 - 132
Tetrachloroethene	500	U	10000	9480		ug/L		95	52 - 129
trans-1,2-Dichloroethene	210	J	10000	9670		ug/L		95	69 - 126
Trichloroethene	500	U	10000	9110		ug/L		91	56 - 124
Vinyl chloride	12000		10000	22900		ug/L		111	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*104*		*47 - 134*
Toluene-d8 (Surr)	*94*		*69 - 122*
Dibromofluoromethane (Surr)	*93*		*78 - 129*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144754-B-2 MSD
Matrix: Water
Analysis Batch: 474864

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	500	U	10000	10800		ug/L		108	64 - 132	11	35
Tetrachloroethene	500	U	10000	10200		ug/L		102	52 - 129	7	35
trans-1,2-Dichloroethene	210	J	10000	10800		ug/L		106	69 - 126	11	35
Trichloroethene	500	U	10000	9990		ug/L		100	56 - 124	9	35
Vinyl chloride	12000		10000	25200		ug/L		134	49 - 136	9	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*95*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474631/5
Matrix: Water
Analysis Batch: 474631

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 10:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/26/21 10:51*	*1*

Lab Sample ID: LCS 240-474631/4
Matrix: Water
Analysis Batch: 474631

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	9.80		ug/L		98	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144711-O-2 MS
Matrix: Water
Analysis Batch: 474631

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	9.26		ug/L		93	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*70 - 133*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144711-O-2 MSD
Matrix: Water
Analysis Batch: 474631

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.91		ug/L		99	46 - 170	7	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144749-1

GC/MS VOA

Analysis Batch: 474631

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144749-2	MW-143S_021921	Total/NA	Water	8260B SIM	
MB 240-474631/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474631/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144711-O-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144711-O-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474864

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144749-1	TRIP BLANK	Total/NA	Water	8260B	
240-144749-2	MW-143S_021921	Total/NA	Water	8260B	
MB 240-474864/8	Method Blank	Total/NA	Water	8260B	
LCS 240-474864/5	Lab Control Sample	Total/NA	Water	8260B	
240-144754-B-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144754-B-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144749-1

Client Sample ID: TRIP BLANK
Date Collected: 02/19/21 00:00
Date Received: 02/23/21 09:20

Lab Sample ID: 240-144749-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474864	03/01/21 14:46	HMB	TAL CAN

Client Sample ID: MW-143S_021921
Date Collected: 02/19/21 13:00
Date Received: 02/23/21 09:20

Lab Sample ID: 240-144749-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474864	03/01/21 15:11	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		1	474631	02/26/21 16:19	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144749-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Allyson Hartz		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

COC No: 1 of 1 COCs

For lab use only: ☐ Walk-in client ☐ Lab sampling Job/SDG No:

Analysis Turnaround Time

TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day

10 day

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 trip blank
MW-1435_021921	2/19/21	13:00		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-144749 Chain of Custody

Possible Hazard Identification

☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by:	Arcadis	2/19/21 14:30	Received by: Novi cold storage	Arcadis	2/19/21 14:30
Relinquished by:	Arcadis	2/22/2021	Received by:	ETA	2/22/21 10:05
Relinquished by:	ETA	2/22/21 11:19	Received in Laboratory by:	TA	2-23-21 920

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 44749
Canton Facility

Client Arcadis Site Name

Cooler Received on 2-23-21 Opened on 2-23-21

Cooler unpacked by:

FedEx: 1st (Grd) Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2-5 °C Corrected Cooler Temp. 2-6 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC907861
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #	Yes	No
17. Was a LL Hg or Me Hg trip blank present?	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container.
Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.
Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

DATA VERIFICATION REPORT

March 09, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144749-1
Sample date: 2021-02-19
Report received by CADENA: 2021-03-09
Initial Data Verification completed by CADENA: 2021-03-09
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144749-1

		Sample Name:	TRIP BLANK				MW-143S_021921			
		Lab Sample ID:	2401447491				2401447492			
		Sample Date:	2/19/2021				2/19/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

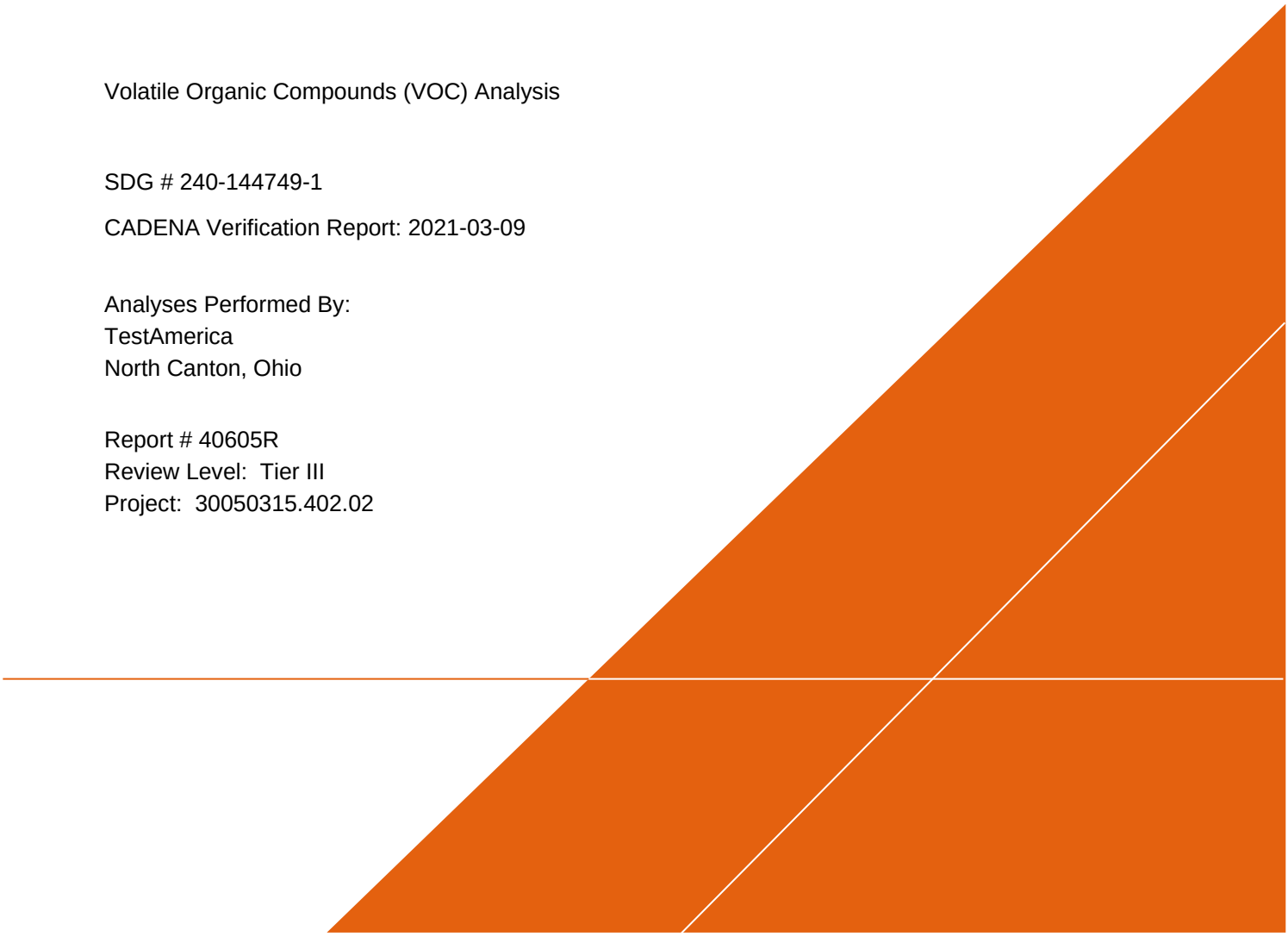
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144749-1

CADENA Verification Report: 2021-03-09

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40605R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144749-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144749-1	Water	02/19/2021		X	
MW-143S_021921	240-144749-2	Water	02/19/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

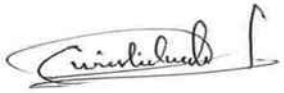
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 18, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 19, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

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TestAmerica Laboratories, Inc.

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Alyson Hartz	TAT if different from below: 10 day; ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	✓	X	X	X	1 trip blank
MW-1435_021921	2/19/21	13:00		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-144749 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: Alyson Hartz	Arcadis	2/19/21 14:30	Received by: Novi Cold Storage	Arcadis	2/19/21 14:30
Relinquished by: Julia McClafferty	Arcadis	2/22/2021	Received by: Amanda Battenfield	ETA	2/22/21 10:05
Relinquished by: Amanda Battenfield	ETA	2/22/21 11:19	Received in Laboratory by:	TA	2-23-21 920

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144749-1
Date Collected: 02/19/21 00:00
Matrix: Water
Date Received: 02/23/21 09:20

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 14:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 14:46	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 14:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 14:46	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 14:46	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 14:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*03/01/21 14:46*	*1*
4-Bromofluorobenzene (Surr)	*104*		*47 - 134*		*03/01/21 14:46*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*03/01/21 14:46*	*1*
Dibromofluoromethane (Surr)	*107*		*78 - 129*		*03/01/21 14:46*	*1*

Client Sample ID: MW-143S_021921
Lab Sample ID: 240-144749-2
Date Collected: 02/19/21 13:00
Matrix: Water
Date Received: 02/23/21 09:20

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 16:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*70 - 133*		*02/26/21 16:19*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 15:11	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 15:11	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 15:11	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 15:11	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 15:11	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 15:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*75 - 130*		*03/01/21 15:11*	*1*
4-Bromofluorobenzene (Surr)	*101*		*47 - 134*		*03/01/21 15:11*	*1*
Toluene-d8 (Surr)	*91*		*69 - 122*		*03/01/21 15:11*	*1*
Dibromofluoromethane (Surr)	*110*		*78 - 129*		*03/01/21 15:11*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144575-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
2/28/2021 2:06:19 PM

Michael DelMonico, Project Manager I
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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144575-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144575-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144575-1

Comments
No additional comments.

Receipt
The samples were received on 2/17/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.1° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144575-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144575-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144575-1	TRIP BLANK	Water	02/12/21 00:00	02/17/21 08:00	
240-144575-2	MW-115S_021221	Water	02/12/21 15:29	02/17/21 08:00	
240-144575-3	DUP-10	Water	02/12/21 00:00	02/17/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144575-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144575-1

No Detections.

Client Sample ID: MW-115S_021221 — Lab Sample ID: 240-144575-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	1.9		1.0	0.20	ug/L	1		8260B	Total/NA

Client Sample ID: DUP-10 — Lab Sample ID: 240-144575-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	2.0		1.0	0.20	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144575-1

Client Sample ID: TRIP BLANK

Date Collected: 02/12/21 00:00
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144575-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 16:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/23/21 16:44	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 16:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 16:44	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/23/21 16:44	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/23/21 16:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*75 - 130*		*02/23/21 16:44*	*1*
4-Bromofluorobenzene (Surr)	*93*		*47 - 134*		*02/23/21 16:44*	*1*
Toluene-d8 (Surr)	*104*		*69 - 122*		*02/23/21 16:44*	*1*
Dibromofluoromethane (Surr)	*100*		*78 - 129*		*02/23/21 16:44*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144575-1

Client Sample ID: MW-115S_021221
Date Collected: 02/12/21 15:29
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144575-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 19:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/22/21 19:33*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 17:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/23/21 17:06	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 17:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 17:06	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/23/21 17:06	1
Vinyl chloride	**1.9**		1.0	0.20	ug/L			02/23/21 17:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*90*		*75 - 130*		*02/23/21 17:06*	*1*
4-Bromofluorobenzene (Surr)	*76*		*47 - 134*		*02/23/21 17:06*	*1*
Toluene-d8 (Surr)	*91*		*69 - 122*		*02/23/21 17:06*	*1*
Dibromofluoromethane (Surr)	*88*		*78 - 129*		*02/23/21 17:06*	*1*

Client Sample ID: DUP-10
Date Collected: 02/12/21 00:00
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144575-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 19:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/22/21 19:58*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 17:28	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/23/21 17:28	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 17:28	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 17:28	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/23/21 17:28	1
Vinyl chloride	**2.0**		1.0	0.20	ug/L			02/23/21 17:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*02/23/21 17:28*	*1*
4-Bromofluorobenzene (Surr)	*86*		*47 - 134*		*02/23/21 17:28*	*1*
Toluene-d8 (Surr)	*98*		*69 - 122*		*02/23/21 17:28*	*1*
Dibromofluoromethane (Surr)	*100*		*78 - 129*		*02/23/21 17:28*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144575-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144575-1	TRIP BLANK	102	93	104	100
240-144575-2	MW-115S_021221	90	76	91	88
240-144575-3	DUP-10	100	86	98	100
240-144576-D-2 MS	Matrix Spike	97	96	103	97
240-144576-E-2 MSD	Matrix Spike Duplicate	95	93	98	97
LCS 240-474092/4	Lab Control Sample	101	103	105	109
MB 240-474092/6	Method Blank	98	87	101	98

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144575-2	MW-115S_021221	81
240-144575-3	DUP-10	80
240-144576-G-2 MS	Matrix Spike	81
240-144576-G-2 MSD	Matrix Spike Duplicate	81
LCS 240-473970/4	Lab Control Sample	80
MB 240-473970/5	Method Blank	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474092/6
Matrix: Water
Analysis Batch: 474092

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 11:10	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/23/21 11:10	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 11:10	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 11:10	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/23/21 11:10	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/23/21 11:10	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 130*		*02/23/21 11:10*	*1*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*		*02/23/21 11:10*	*1*
Toluene-d8 (Surr)	*101*		*69 - 122*		*02/23/21 11:10*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*02/23/21 11:10*	*1*

Lab Sample ID: LCS 240-474092/4
Matrix: Water
Analysis Batch: 474092

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.9		ug/L		109	73 - 129
cis-1,2-Dichloroethene	10.0	10.8		ug/L		108	75 - 124
Tetrachloroethene	10.0	11.7		ug/L		117	70 - 125
trans-1,2-Dichloroethene	10.0	10.6		ug/L		106	74 - 130
Trichloroethene	10.0	10.4		ug/L		104	71 - 121
Vinyl chloride	10.0	11.4		ug/L		114	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*
Toluene-d8 (Surr)	*105*		*69 - 122*
Dibromofluoromethane (Surr)	*109*		*78 - 129*

Lab Sample ID: 240-144576-D-2 MS
Matrix: Water
Analysis Batch: 474092

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.00		ug/L		90	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	9.45		ug/L		95	68 - 121
Tetrachloroethene	1.0	U	10.0	8.55		ug/L		85	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.17		ug/L		92	69 - 126
Trichloroethene	1.0	U	10.0	9.03		ug/L		90	56 - 124
Vinyl chloride	1.0	U	10.0	9.58		ug/L		96	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*
Toluene-d8 (Surr)	*103*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144576-D-2 MS
Matrix: Water
Analysis Batch: 474092

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	97		78 - 129

Lab Sample ID: 240-144576-E-2 MSD
Matrix: Water
Analysis Batch: 474092

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.58		ug/L		96	64 - 132	6	35
cis-1,2-Dichloroethene	1.0	U	10.0	9.91		ug/L		99	68 - 121	5	35
Tetrachloroethene	1.0	U	10.0	10.1		ug/L		101	52 - 129	17	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.82		ug/L		98	69 - 126	7	35
Trichloroethene	1.0	U	10.0	10.2		ug/L		102	56 - 124	12	35
Vinyl chloride	1.0	U	10.0	10.5		ug/L		105	49 - 136	9	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	95		75 - 130
4-Bromofluorobenzene (Surr)	93		47 - 134
Toluene-d8 (Surr)	98		69 - 122
Dibromofluoromethane (Surr)	97		78 - 129

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473970/5
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 14:03	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	81		70 - 133		02/22/21 14:03	1

Lab Sample ID: LCS 240-473970/4
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.3		ug/L		103	80 - 135

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	80		70 - 133

Lab Sample ID: 240-144576-G-2 MS
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	10.7		ug/L		107	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

Lab Sample ID: 240-144576-G-2 MSD
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	11.1		ug/L		111	46 - 170	4	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144575-1

GC/MS VOA

Analysis Batch: 473970

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144575-2	MW-115S_021221	Total/NA	Water	8260B SIM	
240-144575-3	DUP-10	Total/NA	Water	8260B SIM	
MB 240-473970/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-473970/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144576-G-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144576-G-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474092

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144575-1	TRIP BLANK	Total/NA	Water	8260B	
240-144575-2	MW-115S_021221	Total/NA	Water	8260B	
240-144575-3	DUP-10	Total/NA	Water	8260B	
MB 240-474092/6	Method Blank	Total/NA	Water	8260B	
LCS 240-474092/4	Lab Control Sample	Total/NA	Water	8260B	
240-144576-D-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144576-E-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144575-1

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144575-1
Date Collected: 02/12/21 00:00
Matrix: Water
Date Received: 02/17/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474092	02/23/21 16:44	LEE	TAL CAN

Client Sample ID: MW-115S_021221
Lab Sample ID: 240-144575-2
Date Collected: 02/12/21 15:29
Matrix: Water
Date Received: 02/17/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474092	02/23/21 17:06	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	473970	02/22/21 19:33	SAM	TAL CAN

Client Sample ID: DUP-10
Lab Sample ID: 240-144575-3
Date Collected: 02/12/21 00:00
Matrix: Water
Date Received: 02/17/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474092	02/23/21 17:28	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	473970	02/22/21 19:58	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144575-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

TestAmerica

MICHIGAN 190

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Andrew Barnett	TAT if different from below: 10 day ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	2/12/21	–		1						1					N	G	X	X	X	X	X	X	X	Trip Blank
MW-115S_021221	2/12/2	1529		6						6					N	G	X	X	X	X	X	X	X	3 vols method 8260B 3 vols method 8260B SIM
DUP-10	2/12/21	–		6						6					N	G	X	X	X	X	X	X	X	1

240-144575 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	2/12/21 1820	Novi Cold Storage	Arcadis	2/12/21 1820
[signature]	ARCADIS	2/15/21 1010	[signature]	ETA	2/15/21 1010
[signature]	ETA	2/15/21 10:57	Received in Laboratory by:	Company:	Date/Time:

COLD STORAGE ETA 2/15/21 10:57

[signature] ETA 2/16/21 907 [signature] ETA 2-17-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 144575**
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: MattSnyder

Cooler Received on 2-17-21 Opened on 2-17-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form

IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.3 °C Corrected Cooler Temp. 1.4 °C

IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity _____	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	(Yes)	No
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

February 28, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144575-1
Sample date: 2021-02-12
Report received by CADENA: 2021-02-28
Initial Data Verification completed by CADENA: 2021-02-28
Number of Samples:3
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144575-1

		Sample Name:	TRIP BLANK				MW-115S_021221				DUP-10			
		Lab Sample ID:	2401445751				2401445752				2401445753			
		Sample Date:	2/12/2021				2/12/2021				2/12/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC													
OSW-8260B													
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	1.9	1.0	ug/l	---	2.0	1.0	ug/l	---
OSW-8260BBSim													
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

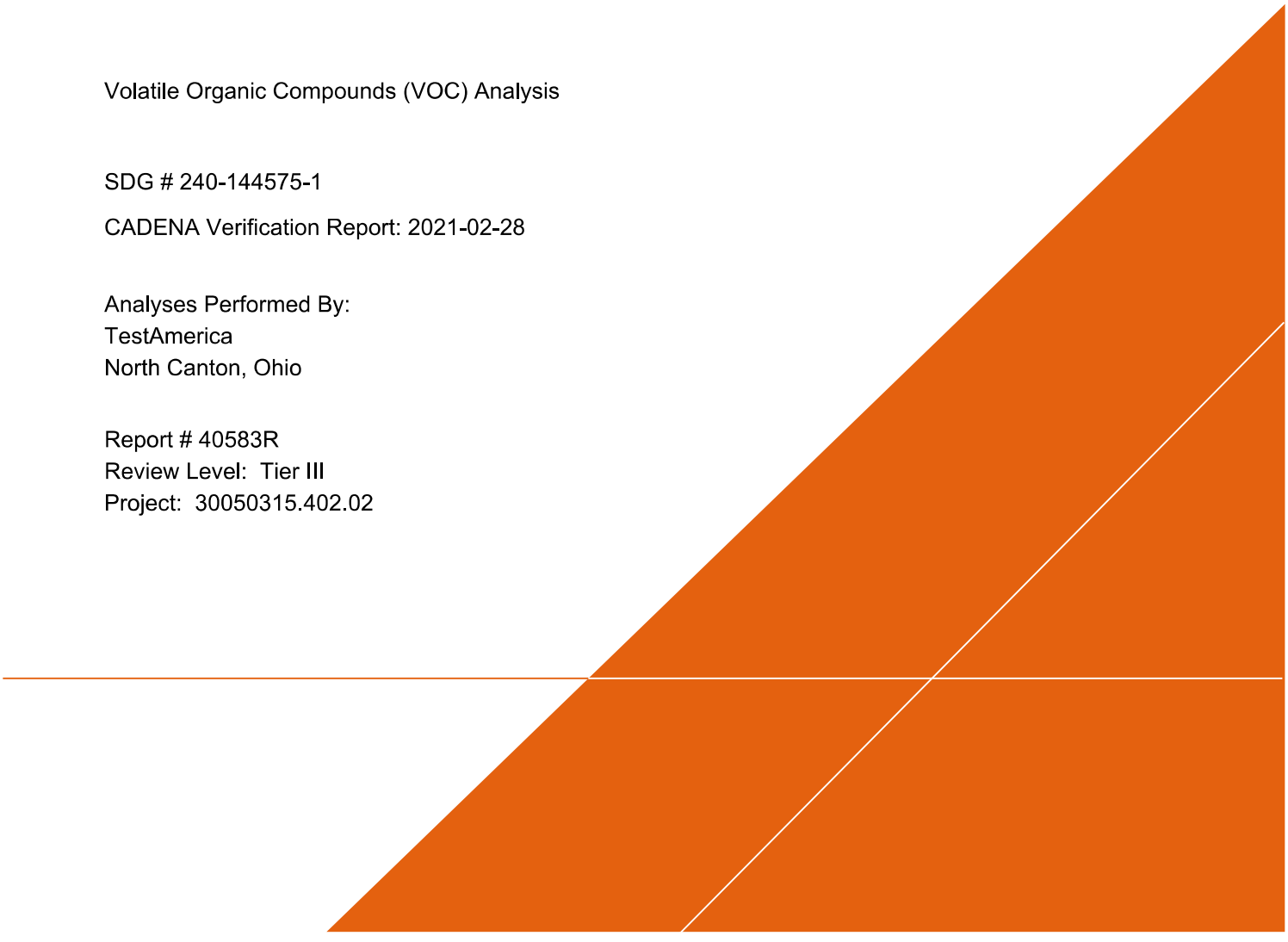
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144575-1

CADENA Verification Report: 2021-02-28

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40583R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144575-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144575-1	Water	02/12/2021		X	
MW-115S_021221	240-144575-2	Water	02/12/2021		X	X
DUP-10	240-144575-3	Water	02/12/2021	MW-115S_021221	X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result (µg/L)	Duplicate Result (µg/L)	RPD
MW-115S_021221 / DUP-10	Vinyl chloride	1.9	2.0	AC

Notes:

AC – Acceptable

The calculated differences between the parent sample and field duplicate were acceptable.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 17, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 18, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

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TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Andrew Bantt	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	2/12/21	—		1						1					N	G	X	X	X	X	X	X	X	Trip Blank
MW-11SS_021221	2/12/21	1529		6						6					N	G	X	X	X	X	X	X	X	3 vials Method 8260B 3 vials Method 8260B SIM
DUP-10	2/12/21	—		6						6					N	G	X	X	X	X	X	X	X	1

240-144575 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Andrew Bantt	Arcadis	2/12/21 1820	Novi Cold Storage	Arcadis	2/12/21 1820
Christin Ware	ARCADIS	2/15/21 1010	Amanda Battenfield	ETA	2/15/21 1010
Amanda Battenfield	ETA	2/15/21 10:57	Received in Laboratory by:	Company:	Date/Time:

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COLD STORAGE ETA 2/15/21 10:57

Amanda Battenfield ETA 2/16/21 907 ETA 2-17-21 800

02/28/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144575-1
Date Collected: 02/12/21 00:00
Matrix: Water
Date Received: 02/17/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 16:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/23/21 16:44	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 16:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 16:44	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/23/21 16:44	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/23/21 16:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*75 - 130*		*02/23/21 16:44*	*1*
4-Bromofluorobenzene (Surr)	*93*		*47 - 134*		*02/23/21 16:44*	*1*
Toluene-d8 (Surr)	*104*		*69 - 122*		*02/23/21 16:44*	*1*
Dibromofluoromethane (Surr)	*100*		*78 - 129*		*02/23/21 16:44*	*1*

Client Sample ID: MW-115S_021221
Lab Sample ID: 240-144575-2
Date Collected: 02/12/21 15:29
Matrix: Water
Date Received: 02/17/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 19:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/22/21 19:33*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 17:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/23/21 17:06	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 17:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 17:06	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/23/21 17:06	1
Vinyl chloride	**1.9**		1.0	0.20	ug/L			02/23/21 17:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*90*		*75 - 130*		*02/23/21 17:06*	*1*
4-Bromofluorobenzene (Surr)	*76*		*47 - 134*		*02/23/21 17:06*	*1*
Toluene-d8 (Surr)	*91*		*69 - 122*		*02/23/21 17:06*	*1*
Dibromofluoromethane (Surr)	*88*		*78 - 129*		*02/23/21 17:06*	*1*

Client Sample ID: DUP-10
Lab Sample ID: 240-144575-3
Date Collected: 02/12/21 00:00
Matrix: Water
Date Received: 02/17/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 19:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/22/21 19:58*	*1*

Client Sample ID: DUP-10
Date Collected: 02/12/21 00:00
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144575-3
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 17:28	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/23/21 17:28	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 17:28	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 17:28	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/23/21 17:28	1
Vinyl chloride	**2.0**		1.0	0.20	ug/L			02/23/21 17:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*02/23/21 17:28*	*1*
4-Bromofluorobenzene (Surr)	*86*		*47 - 134*		*02/23/21 17:28*	*1*
Toluene-d8 (Surr)	*98*		*69 - 122*		*02/23/21 17:28*	*1*
Dibromofluoromethane (Surr)	*100*		*78 - 129*		*02/23/21 17:28*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144430-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
2/24/2021 11:13:57 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144430-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
F1	MS and/or MSD recovery exceeds control limits.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144430-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144430-1

Comments
No additional comments.

Receipt
The samples were received on 2/12/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.4° C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) associated with batch 473378 recovered above the upper control limit for 1,1-Dichloroethene. The samples associated with this CCV were non-detect for the affected analyte; therefore, the data have been reported. The associated samples are impacted: TRIP BLANK (240-144430-1) and MW-123S_021021 (240-144430-2).

Method 8260B: The laboratory control sample (LCS) for 473378 recovered outside control limits for the following analyte: 1,1-Dichloroethene. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported: TRIP BLANK (240-144430-1), MW-123S_021021 (240-144430-2) and (LCS 240-473378/4).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144430-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144430-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144430-1	TRIP BLANK	Water	02/10/21 00:00	02/12/21 08:00	
240-144430-2	MW-123S_021021	Water	02/10/21 14:12	02/12/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144430-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144430-1

No Detections.

Client Sample ID: MW-123S_021021 — Lab Sample ID: 240-144430-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	1.7		1.0	0.20	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144430-1

Client Sample ID: TRIP BLANK
Date Collected: 02/10/21 00:00
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144430-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/17/21 13:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 13:19	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 13:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 13:19	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 13:19	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 13:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*75 - 130*		*02/17/21 13:19*	*1*
4-Bromofluorobenzene (Surr)	*84*		*47 - 134*		*02/17/21 13:19*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*02/17/21 13:19*	*1*
Dibromofluoromethane (Surr)	*104*		*78 - 129*		*02/17/21 13:19*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144430-1

Client Sample ID: MW-123S_021021

Date Collected: 02/10/21 14:12
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144430-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 19:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/18/21 19:11*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/17/21 13:41	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 13:41	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 13:41	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 13:41	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 13:41	1
Vinyl chloride	**1.7**		1.0	0.20	ug/L			02/17/21 13:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*118*		*75 - 130*		*02/17/21 13:41*	*1*
4-Bromofluorobenzene (Surr)	*82*		*47 - 134*		*02/17/21 13:41*	*1*
Toluene-d8 (Surr)	*88*		*69 - 122*		*02/17/21 13:41*	*1*
Dibromofluoromethane (Surr)	*104*		*78 - 129*		*02/17/21 13:41*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144430-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144430-1	TRIP BLANK	119	84	90	104
240-144430-2	MW-123S_021021	118	82	88	104
240-144433-A-2 MS	Matrix Spike	108	108	96	96
240-144433-E-2 MSD	Matrix Spike Duplicate	106	108	97	96
LCS 240-473378/4	Lab Control Sample	108	109	99	98
MB 240-473378/7	Method Blank	112	88	88	96

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144425-C-2 MS	Matrix Spike	82
240-144425-C-2 MSD	Matrix Spike Duplicate	81
240-144430-2	MW-123S_021021	80
LCS 240-473604/4	Lab Control Sample	81
MB 240-473604/5	Method Blank	80

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473378/7
Matrix: Water
Analysis Batch: 473378

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 10:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 10:46	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 10:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 10:46	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 10:46	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 10:46	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*75 - 130*		*02/17/21 10:46*	*1*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*		*02/17/21 10:46*	*1*
Toluene-d8 (Surr)	*88*		*69 - 122*		*02/17/21 10:46*	*1*
Dibromofluoromethane (Surr)	*96*		*78 - 129*		*02/17/21 10:46*	*1*

Lab Sample ID: LCS 240-473378/4
Matrix: Water
Analysis Batch: 473378

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	15.6	*+	ug/L		156	73 - 129
cis-1,2-Dichloroethene	10.0	9.70		ug/L		97	75 - 124
Tetrachloroethene	10.0	9.82		ug/L		98	70 - 125
trans-1,2-Dichloroethene	10.0	9.77		ug/L		98	74 - 130
Trichloroethene	10.0	9.22		ug/L		92	71 - 121
Vinyl chloride	10.0	7.79		ug/L		78	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*108*		*75 - 130*
4-Bromofluorobenzene (Surr)	*109*		*47 - 134*
Toluene-d8 (Surr)	*99*		*69 - 122*
Dibromofluoromethane (Surr)	*98*		*78 - 129*

Lab Sample ID: 240-144433-A-2 MS
Matrix: Water
Analysis Batch: 473378

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U F1 *+	10.0	16.4	F1	ug/L		164	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	8.88		ug/L		89	68 - 121
Tetrachloroethene	1.0	U	10.0	8.79		ug/L		88	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	8.74		ug/L		87	69 - 126
Trichloroethene	1.0	U	10.0	8.38		ug/L		84	56 - 124
Vinyl chloride	1.0	U	10.0	6.85		ug/L		69	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*108*		*75 - 130*
4-Bromofluorobenzene (Surr)	*108*		*47 - 134*
Toluene-d8 (Surr)	*96*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144433-A-2 MS
Matrix: Water
Analysis Batch: 473378

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	96		78 - 129

Lab Sample ID: 240-144433-E-2 MSD
Matrix: Water
Analysis Batch: 473378

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U F1 *+	10.0	13.8	F1	ug/L		138	64 - 132	18	35
cis-1,2-Dichloroethene	1.0	U	10.0	8.85		ug/L		89	68 - 121	0	35
Tetrachloroethene	1.0	U	10.0	8.74		ug/L		87	52 - 129	1	35
trans-1,2-Dichloroethene	1.0	U	10.0	8.79		ug/L		88	69 - 126	1	35
Trichloroethene	1.0	U	10.0	8.35		ug/L		83	56 - 124	0	35
Vinyl chloride	1.0	U	10.0	6.56		ug/L		66	49 - 136	4	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	106		75 - 130
4-Bromofluorobenzene (Surr)	108		47 - 134
Toluene-d8 (Surr)	97		69 - 122
Dibromofluoromethane (Surr)	96		78 - 129

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473604/5
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 12:27	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	80		70 - 133		02/18/21 12:27	1

Lab Sample ID: LCS 240-473604/4
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.5		ug/L		105	80 - 135

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	81		70 - 133

Lab Sample ID: 240-144425-C-2 MS
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	11.1		ug/L		111	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144425-C-2 MSD
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.7		ug/L		107	46 - 170	3	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144430-1

GC/MS VOA

Analysis Batch: 473378

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144430-1	TRIP BLANK	Total/NA	Water	8260B	
240-144430-2	MW-123S_021021	Total/NA	Water	8260B	
MB 240-473378/7	Method Blank	Total/NA	Water	8260B	
LCS 240-473378/4	Lab Control Sample	Total/NA	Water	8260B	
240-144433-A-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144433-E-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 473604

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144430-2	MW-123S_021021	Total/NA	Water	8260B SIM	
MB 240-473604/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-473604/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144425-C-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144425-C-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144430-1

Client Sample ID: TRIP BLANK
Date Collected: 02/10/21 00:00
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144430-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473378	02/17/21 13:19	LEE	TAL CAN

Client Sample ID: MW-123S_021021
Date Collected: 02/10/21 14:12
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144430-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473378	02/17/21 13:41	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	473604	02/18/21 19:11	SAM	TAL CAN

Laboratory References:
TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144430-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

MICHIGAN 190 — TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Andrew Barth	TAT if different from below: 10 day; ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	2/10/21	—		1						1					N	G	X	X	X	X	X	X	X	Trip Blank
MW-1235_021021	2/10/21	1412		6						6					N	G	X	X	X	X	X	X	X	3 vials for 8260B 3 vials for 8260B SIM

240-144430 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	2/10/21 1725	Novi Cold Storage	Arcadis	2/10/21 1725
[signature]	ARCADIS	2/11/21 0953	[signature]	ETA	2/11/21 0953
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
			[signature]	ETN	2-12-21 SOC

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 14430**
Canton Facility

Client Arcadis Site Name

Cooler Received on 2-12-21 Opened on 2-12-21 800

Cooler unpacked by: Ryan C

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☑ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 3	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No RAC 2-12-21
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC907861
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 59072	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

February 24, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144430-1
Sample date: 2021-02-10
Report received by CADENA: 2021-02-24
Initial Data Verification completed by CADENA: 2021-02-24
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 473378 LCS recoveries were outliers biased high for the following analyte: 1,1-DICHLOROETHENE. Associated client sample results were non-detect so qualification was not required based on this high bias QC outlier.

GCMS VOC QC batch MS/MSD recovery outliers were not determined using a client sample so qualification was not required based on these sample-specific QC outliers.

GCMS VOC QC batch CCV response outliers as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144430-1

		Sample Name:	TRIP BLANK				MW-123S_021021			
		Lab Sample ID:	2401444301				2401444302			
		Sample Date:	2/10/2021				2/10/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	1.7	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

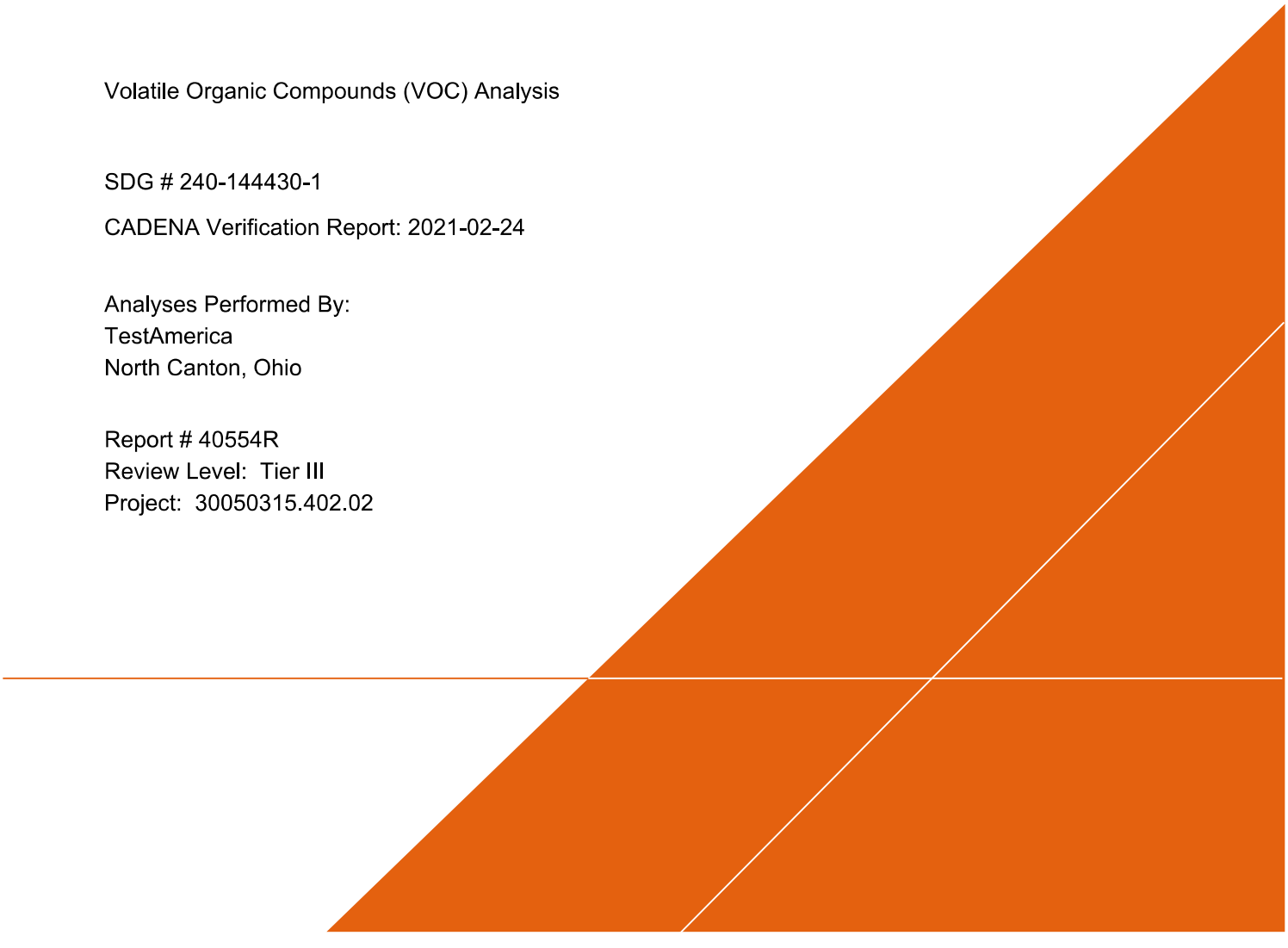
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144430-1

CADENA Verification Report: 2021-02-24

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40554R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144430-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144430-1	Water	02/10/2021		X	
MW-123S_021021	240-144430-2	Water	02/10/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial/Continuing	Compound	Criteria
TRIP BLANK MW-123S_021021	CCV %D	1,1-Dichloroethene	+49.0%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J

Initial/Continuing	Criteria	Sample Result	Qualification
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1] RRF of 0.01 only applies to compounds which are typically poor responding compounds (i.e., ketones, 1,4-dioxane, etc.)

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 17, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Andrew Banitt		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below: 10 day — 3 weeks / ✓ 2 weeks / 1 week / 2 days / 1 day

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM					Sample Specific Notes / Special Instructions:
TRIP BLANK	2/10/21	—		1						1					N	G	X	X	X	X	X	X	X					Trip Blank
MW-1235_021021	2/10/21	1412		6						6					N	G	X	X	X	X	X	X	X					3 vols for 8260B 3 vols for 8260B SIM

240-144430 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ✓ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	2/10/21 1725	Novi Cold Storage	Arcadis	2/10/21 1725
[signature]	ARCADIS	2/11/21 / 0953	[signature]	ETA	2/11/21 0953
			Received in Laboratory by: [signature]	ETA	2-12-21 SCC

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02/24/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144430-1
Date Collected: 02/10/21 00:00
Matrix: Water
Date Received: 02/12/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/17/21 13:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 13:19	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 13:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 13:19	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 13:19	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 13:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*75 - 130*		*02/17/21 13:19*	*1*
4-Bromofluorobenzene (Surr)	*84*		*47 - 134*		*02/17/21 13:19*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*02/17/21 13:19*	*1*
Dibromofluoromethane (Surr)	*104*		*78 - 129*		*02/17/21 13:19*	*1*

Client Sample ID: MW-123S_021021
Lab Sample ID: 240-144430-2
Date Collected: 02/10/21 14:12
Matrix: Water
Date Received: 02/12/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 19:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/18/21 19:11*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/17/21 13:41	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 13:41	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 13:41	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 13:41	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 13:41	1
Vinyl chloride	**1.7**		1.0	0.20	ug/L			02/17/21 13:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*118*		*75 - 130*		*02/17/21 13:41*	*1*
4-Bromofluorobenzene (Surr)	*82*		*47 - 134*		*02/17/21 13:41*	*1*
Toluene-d8 (Surr)	*88*		*69 - 122*		*02/17/21 13:41*	*1*
Dibromofluoromethane (Surr)	*104*		*78 - 129*		*02/17/21 13:41*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144561-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
2/28/2021 1:58:27 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
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Have a Question? Ask The Expert
Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144561-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
S1-	Surrogate recovery exceeds control limits, low biased.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144561-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144561-1

Comments
No additional comments.

Receipt
The samples were received on 2/17/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.5º C.

GC/MS VOA
Method 8260B: The laboratory control sample (LCS) for analytical batch 240-474305 recovered outside control limits for the following analyte: Tetrachloroethane. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data has been reported: TRIP BLANK (240-144561-1) and (LCS 240-474305/4).

Method 8260B: Internal standard (ISTD) response for the following sample was outside of acceptance limits: TRIP BLANK (240-144561-1). The sample was not re-analyzed due to insufficient volume.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144561-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144561-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144561-1	TRIP BLANK	Water	02/15/21 00:00	02/17/21 08:00	
240-144561-2	MW-145S_021521	Water	02/15/21 16:00	02/17/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144561-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144561-1

No Detections.

Client Sample ID: MW-145S_021521 — Lab Sample ID: 240-144561-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144561-1

Client Sample ID: TRIP BLANK
Date Collected: 02/15/21 00:00
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144561-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 20:18	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 20:18	1
Tetrachloroethene	1.0	U *+	1.0	0.15	ug/L			02/24/21 20:18	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 20:18	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 20:18	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 20:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*75 - 130*		*02/24/21 20:18*	*1*
4-Bromofluorobenzene (Surr)	*58*		*47 - 134*		*02/24/21 20:18*	*1*
Toluene-d8 (Surr)	*82*		*69 - 122*		*02/24/21 20:18*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*02/24/21 20:18*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144561-1

Client Sample ID: MW-145S_021521
Date Collected: 02/15/21 16:00
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144561-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 16:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/22/21 16:35*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 17:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 17:46	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 17:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 17:46	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 17:46	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 17:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*		*02/25/21 17:46*	*1*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*		*02/25/21 17:46*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*02/25/21 17:46*	*1*
Dibromofluoromethane (Surr)	*87*		*78 - 129*		*02/25/21 17:46*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144561-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144561-1	TRIP BLANK	85	58	82	103
240-144561-2	MW-145S_021521	86	95	92	87
240-144568-B-3 MS	Matrix Spike	71 S1-	86	92	87
240-144568-E-3 MSD	Matrix Spike Duplicate	69 S1-	91	93	88
240-144661-D-2 MS	Matrix Spike	84	99	93	86
240-144661-E-2 MSD	Matrix Spike Duplicate	84	99	94	87
LCS 240-474305/4	Lab Control Sample	88	87	89	91
LCS 240-474500/4	Lab Control Sample	85	101	93	86
MB 240-474305/7	Method Blank	98	67	84	103
MB 240-474500/7	Method Blank	86	98	94	86

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144518-M-2 MS	Matrix Spike	84
240-144518-M-2 MSD	Matrix Spike Duplicate	84
240-144561-2	MW-145S_021521	82
LCS 240-473970/4	Lab Control Sample	80
MB 240-473970/5	Method Blank	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474305/7
Matrix: Water
Analysis Batch: 474305

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 14:13	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 14:13	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 14:13	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 14:13	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 14:13	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 14:13	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 130*		*02/24/21 14:13*	*1*
4-Bromofluorobenzene (Surr)	*67*		*47 - 134*		*02/24/21 14:13*	*1*
Toluene-d8 (Surr)	*84*		*69 - 122*		*02/24/21 14:13*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*02/24/21 14:13*	*1*

Lab Sample ID: LCS 240-474305/4
Matrix: Water
Analysis Batch: 474305

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.8		ug/L		108	73 - 129
cis-1,2-Dichloroethene	10.0	9.69		ug/L		97	75 - 124
Tetrachloroethene	10.0	12.6	*+	ug/L		126	70 - 125
trans-1,2-Dichloroethene	10.0	11.0		ug/L		110	74 - 130
Trichloroethene	10.0	10.3		ug/L		103	71 - 121
Vinyl chloride	10.0	9.04		ug/L		90	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 130*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*
Toluene-d8 (Surr)	*89*		*69 - 122*
Dibromofluoromethane (Surr)	*91*		*78 - 129*

Lab Sample ID: 240-144568-B-3 MS
Matrix: Water
Analysis Batch: 474305

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.41		ug/L		94	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	8.71		ug/L		87	68 - 121
Tetrachloroethene	1.0	U *+	10.0	11.6		ug/L		116	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.81		ug/L		98	69 - 126
Trichloroethene	1.0	U	10.0	9.03		ug/L		90	56 - 124
Vinyl chloride	1.0	U	10.0	8.44		ug/L		84	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*71*	*S1-*	*75 - 130*
4-Bromofluorobenzene (Surr)	*86*		*47 - 134*
Toluene-d8 (Surr)	*92*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144568-B-3 MS
Matrix: Water
Analysis Batch: 474305

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	87		78 - 129

Lab Sample ID: 240-144568-E-3 MSD
Matrix: Water
Analysis Batch: 474305

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.22		ug/L		92	64 - 132	2	35
cis-1,2-Dichloroethene	1.0	U	10.0	8.56		ug/L		86	68 - 121	2	35
Tetrachloroethene	1.0	U *+	10.0	11.0		ug/L		110	52 - 129	6	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.16		ug/L		92	69 - 126	7	35
Trichloroethene	1.0	U	10.0	8.83		ug/L		88	56 - 124	2	35
Vinyl chloride	1.0	U	10.0	8.72		ug/L		87	49 - 136	3	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	69	S1-	75 - 130
4-Bromofluorobenzene (Surr)	91		47 - 134
Toluene-d8 (Surr)	93		69 - 122
Dibromofluoromethane (Surr)	88		78 - 129

Lab Sample ID: MB 240-474500/7
Matrix: Water
Analysis Batch: 474500

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 14:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 14:52	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 14:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 14:52	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 14:52	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 14:52	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	86		75 - 130		02/25/21 14:52	1
4-Bromofluorobenzene (Surr)	98		47 - 134		02/25/21 14:52	1
Toluene-d8 (Surr)	94		69 - 122		02/25/21 14:52	1
Dibromofluoromethane (Surr)	86		78 - 129		02/25/21 14:52	1

Lab Sample ID: LCS 240-474500/4
Matrix: Water
Analysis Batch: 474500

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.93		ug/L		89	73 - 129
cis-1,2-Dichloroethene	10.0	9.08		ug/L		91	75 - 124
Tetrachloroethene	10.0	9.68		ug/L		97	70 - 125
trans-1,2-Dichloroethene	10.0	9.29		ug/L		93	74 - 130
Trichloroethene	10.0	8.87		ug/L		89	71 - 121

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-474500/4
Matrix: Water
Analysis Batch: 474500

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Vinyl chloride			10.0	10.7		ug/L		107	61 - 134		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*75 - 130*
4-Bromofluorobenzene (Surr)	*101*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*86*		*78 - 129*

Lab Sample ID: 240-144661-D-2 MS
Matrix: Water
Analysis Batch: 474500

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
cis-1,2-Dichloroethene	1.0	U	10.0	8.81		ug/L		88	68 - 121		
Tetrachloroethene	1.0	U	10.0	8.35		ug/L		84	52 - 129		
trans-1,2-Dichloroethene	1.0	U	10.0	8.36		ug/L		84	69 - 126		
Trichloroethene	1.0	U	10.0	8.22		ug/L		82	56 - 124		
Vinyl chloride	20		10.0	30.2		ug/L		102	49 - 136		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*
4-Bromofluorobenzene (Surr)	*99*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*86*		*78 - 129*

Lab Sample ID: 240-144661-E-2 MSD
Matrix: Water
Analysis Batch: 474500

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
cis-1,2-Dichloroethene	1.0	U	10.0	8.80		ug/L		88	68 - 121	0	35
Tetrachloroethene	1.0	U	10.0	8.53		ug/L		85	52 - 129	2	35
trans-1,2-Dichloroethene	1.0	U	10.0	8.64		ug/L		86	69 - 126	3	35
Trichloroethene	1.0	U	10.0	8.36		ug/L		84	56 - 124	2	35
Vinyl chloride	20		10.0	29.8		ug/L		98	49 - 136	1	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*
4-Bromofluorobenzene (Surr)	*99*		*47 - 134*
Toluene-d8 (Surr)	*94*		*69 - 122*
Dibromofluoromethane (Surr)	*87*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473970/5
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 14:03	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/22/21 14:03*	*1*

Lab Sample ID: LCS 240-473970/4
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.3		ug/L		103	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*

Lab Sample ID: 240-144518-M-2 MS
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	10.3		ug/L		103	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*

Lab Sample ID: 240-144518-M-2 MSD
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.4		ug/L		104	46 - 170	1	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144561-1

GC/MS VOA

Analysis Batch: 473970

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144561-2	MW-145S_021521	Total/NA	Water	8260B SIM	
MB 240-473970/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-473970/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144518-M-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144518-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474305

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144561-1	TRIP BLANK	Total/NA	Water	8260B	
MB 240-474305/7	Method Blank	Total/NA	Water	8260B	
LCS 240-474305/4	Lab Control Sample	Total/NA	Water	8260B	
240-144568-B-3 MS	Matrix Spike	Total/NA	Water	8260B	
240-144568-E-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 474500

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144561-2	MW-145S_021521	Total/NA	Water	8260B	
MB 240-474500/7	Method Blank	Total/NA	Water	8260B	
LCS 240-474500/4	Lab Control Sample	Total/NA	Water	8260B	
240-144661-D-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144661-E-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144561-1

Client Sample ID: TRIP BLANK
Date Collected: 02/15/21 00:00
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144561-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474305	02/24/21 20:18	LRW	TAL CAN

Client Sample ID: MW-145S_021521
Date Collected: 02/15/21 16:00
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144561-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474500	02/25/21 17:46	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	473970	02/22/21 16:35	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144561-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

0-4/10-5

Chain of Custody Record

MICHIGAN TestAmerica 190

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client; Lab sampling; Job/SDG No:
Phone: 248-994-2240	Method of Shipment/Carrier:			
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-1455-021521	2/15/21	1600		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B; 3VOAs for 8260B SIM

240-144561 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
E Witherspoon	Arcadis	2/15/21 1700	NOVI Cold storage	Arcadis	2/15/21 1700
Christa Ulm	ARCADIS	2/16/21 1009	Amanda Battershell	ETA	2/16/21 1009
Amanda Battershell	ETA	2/16/21 1240	Received in Laboratory by:	ETA	2-17-21 800

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2/28/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 144561**
Canton Facility

Client Arcadis Site Name

Cooler Received on 2-17-21 Opened on 2-17-21

Cooler unpacked by: MathSmith

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # NA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. (0.4) °C Corrected Cooler Temp. (0.5) °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? (Yes) No
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)? (Y)
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____ (Yes) No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

WI-NC-099

DATA VERIFICATION REPORT



February 28, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144561-1
Sample date: 2021-02-15
Report received by CADENA: 2021-02-28
Initial Data Verification completed by CADENA: 2021-02-28
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 474305 LCS recovery was outlying biased high for the following analyte: TETRACHLOROETHENE. Associated client sample results were non-detect so qualification was not required based on this high bias QC outlier.

GCMS VOC QC batch MS/MSD surrogate recovery outliers were not determined using a client sample so qualification was not required based on these sample-specific QC outliers.

GCMS VOC QC batch INTERNAL STANDARD response outliers as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144561-1

		Sample Name:	TRIP BLANK				MW-145S_021521			
		Lab Sample ID:	2401445611				2401445612			
		Sample Date:	2/15/2021				2/15/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

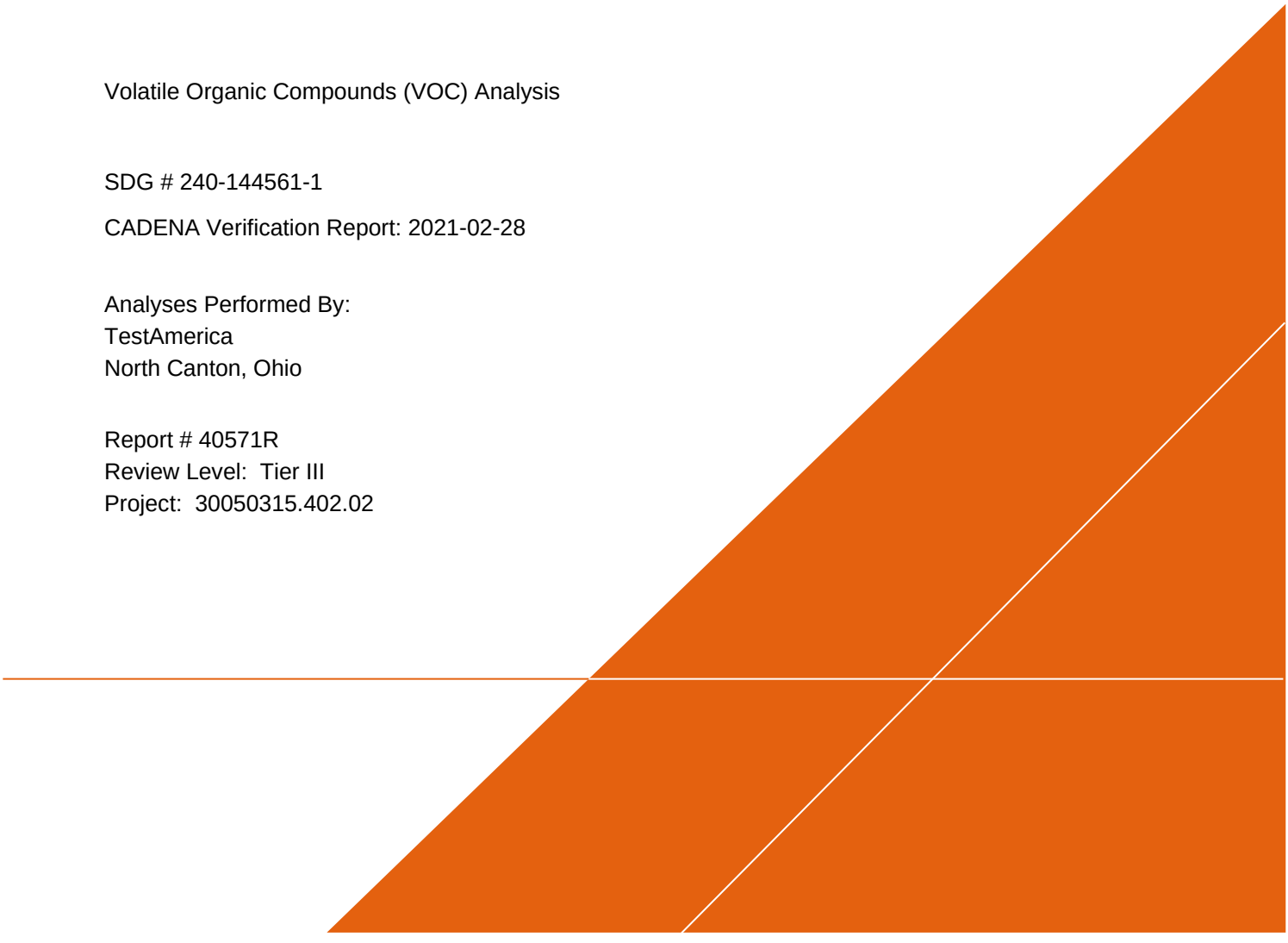
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144561-1

CADENA Verification Report: 2021-02-28

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40571R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144561-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144561-1	Water	02/15/2021		X	
MW-145S_021521	240-144561-2	Water	02/15/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial/Continuing	Lab file ID	Compound	Criteria
TRIP BLANK	CCV %D	UXR3152.D	Tetrachloroethene	+30.7%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action

Initial/Continuing	Criteria	Sample Result	Qualification
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1] RRF of 0.01 only applies to compounds which are typically poor responding compounds (i.e., ketones, 1,4-dioxane, etc.)

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

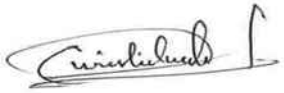
%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 17, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

0-4/0-5

Chain of Custody Record

MICHIGAN TestAmerica 190

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No:
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; 3 weeks / 2 weeks / 1 week / 2 days / 1 day	of COCs
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		For lab use only
Project Number: 30050315.402.04	Shipping/Tracking No:		Walk-in client
PO # 30050315.402.04			Lab sampling
			Job/SDG No:

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-1455-021521	2/15/21	1000		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-144561 Chain of Custody

Possible Hazard Identification: Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / Disposal By Lab / Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Witherspoon	Arcadis	2/15/21 1700	Novi Cold storage	Arcadis	2/15/21 1700
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	ARCADIS	2/16/21 1009		ETA	2/16/21 1009
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
	ETA	2/16/21 12:40		ETA	2-17-21 800

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02/28/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144561-1
Date Collected: 02/15/21 00:00
Matrix: Water
Date Received: 02/17/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 20:18	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 20:18	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 20:18	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 20:18	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 20:18	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 20:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*75 - 130*		*02/24/21 20:18*	*1*
4-Bromofluorobenzene (Surr)	*58*		*47 - 134*		*02/24/21 20:18*	*1*
Toluene-d8 (Surr)	*82*		*69 - 122*		*02/24/21 20:18*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*02/24/21 20:18*	*1*

Client Sample ID: MW-145S_021521
Lab Sample ID: 240-144561-2
Date Collected: 02/15/21 16:00
Matrix: Water
Date Received: 02/17/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 16:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/22/21 16:35*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 17:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 17:46	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 17:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 17:46	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 17:46	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 17:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*		*02/25/21 17:46*	*1*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*		*02/25/21 17:46*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*02/25/21 17:46*	*1*
Dibromofluoromethane (Surr)	*87*		*78 - 129*		*02/25/21 17:46*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144502-1
Client Project/Site: Ford LTP - Off Site
Revision: 1

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/26/2021 9:35:07 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at:
www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144502-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144502-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144502-1

Comments
No additional comments.

Revision
The report being provided is a revision of the original report sent on 2/24/2021. The report (revision 1) is being revised due to: Samples mislabeled during unpacking - revised to correct data..

Receipt
The samples were received on 2/13/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.6° C.

GC/MS VOA
Method 8260B: The following sample was analyzed outside of analytical holding time due to mis-labeled vial: TRIP BLANK (240-144502-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144502-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144502-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144502-1	TRIP BLANK	Water	02/11/21 00:00	02/13/21 08:00	
240-144502-2	MW-148S_021121	Water	02/11/21 13:40	02/13/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144502-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144502-1

No Detections.

Client Sample ID: MW-148S_021121 — Lab Sample ID: 240-144502-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	1.2		1.0	0.20	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144502-1

Client Sample ID: TRIP BLANK
Date Collected: 02/11/21 00:00
Date Received: 02/13/21 08:00

Lab Sample ID: 240-144502-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U H	1.0	0.19	ug/L			03/15/21 16:05	1
cis-1,2-Dichloroethene	1.0	U H	1.0	0.16	ug/L			03/15/21 16:05	1
Tetrachloroethene	1.0	U H	1.0	0.15	ug/L			03/15/21 16:05	1
trans-1,2-Dichloroethene	1.0	U H	1.0	0.19	ug/L			03/15/21 16:05	1
Trichloroethene	1.0	U H	1.0	0.10	ug/L			03/15/21 16:05	1
Vinyl chloride	1.0	U H	1.0	0.20	ug/L			03/15/21 16:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*75 - 130*		*03/15/21 16:05*	*1*
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*		*03/15/21 16:05*	*1*
Toluene-d8 (Surr)	*97*		*69 - 122*		*03/15/21 16:05*	*1*
Dibromofluoromethane (Surr)	*86*		*78 - 129*		*03/15/21 16:05*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144502-1

Client Sample ID: MW-148S_021121
Date Collected: 02/11/21 13:40
Date Received: 02/13/21 08:00

Lab Sample ID: 240-144502-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 21:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*		*02/18/21 21:17*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/19/21 22:09	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/19/21 22:09	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/19/21 22:09	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/19/21 22:09	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/19/21 22:09	1
Vinyl chloride	**1.2**		1.0	0.20	ug/L			02/19/21 22:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*109*		*75 - 130*		*02/19/21 22:09*	*1*
4-Bromofluorobenzene (Surr)	*67*		*47 - 134*		*02/19/21 22:09*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*02/19/21 22:09*	*1*
Dibromofluoromethane (Surr)	*115*		*78 - 129*		*02/19/21 22:09*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144502-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
190-25454-E-1 MS	Matrix Spike	79	97	95	83
190-25454-F-1 MSD	Matrix Spike Duplicate	84	95	95	86
240-144483-A-2 MS	Matrix Spike	88	92	88	98
240-144483-A-2 MSD	Matrix Spike Duplicate	89	88	90	90
240-144502-1	TRIP BLANK	83	96	97	86
240-144502-2	MW-148S_021121	109	67	80	115
LCS 240-473762/4	Lab Control Sample	91	93	88	98
LCS 240-476776/4	Lab Control Sample	78	94	97	83
MB 240-473762/7	Method Blank	100	66	76	107
MB 240-476776/7	Method Blank	80	91	98	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144425-C-2 MS	Matrix Spike	82
240-144425-C-2 MSD	Matrix Spike Duplicate	81
240-144502-2	MW-148S_021121	79
LCS 240-473604/4	Lab Control Sample	81
MB 240-473604/5	Method Blank	80

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473762/7
Matrix: Water
Analysis Batch: 473762

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/19/21 14:36	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/19/21 14:36	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/19/21 14:36	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/19/21 14:36	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/19/21 14:36	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/19/21 14:36	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*02/19/21 14:36*	*1*
4-Bromofluorobenzene (Surr)	*66*		*47 - 134*		*02/19/21 14:36*	*1*
Toluene-d8 (Surr)	*76*		*69 - 122*		*02/19/21 14:36*	*1*
Dibromofluoromethane (Surr)	*107*		*78 - 129*		*02/19/21 14:36*	*1*

Lab Sample ID: LCS 240-473762/4
Matrix: Water
Analysis Batch: 473762

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.4		ug/L		104	73 - 129
cis-1,2-Dichloroethene	10.0	10.2		ug/L		102	75 - 124
Tetrachloroethene	10.0	12.1		ug/L		121	70 - 125
trans-1,2-Dichloroethene	10.0	11.2		ug/L		112	74 - 130
Trichloroethene	10.0	10.7		ug/L		107	71 - 121
Vinyl chloride	10.0	9.44		ug/L		94	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*91*		*75 - 130*
4-Bromofluorobenzene (Surr)	*93*		*47 - 134*
Toluene-d8 (Surr)	*88*		*69 - 122*
Dibromofluoromethane (Surr)	*98*		*78 - 129*

Lab Sample ID: 240-144483-A-2 MS
Matrix: Water
Analysis Batch: 473762

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	91	J	1000	1110		ug/L		102	64 - 132
cis-1,2-Dichloroethene	100	U	1000	955		ug/L		96	68 - 121
Tetrachloroethene	100	U	1000	1130		ug/L		113	52 - 129
trans-1,2-Dichloroethene	100	U	1000	1050		ug/L		105	69 - 126
Trichloroethene	1900		1000	2670		ug/L		78	56 - 124
Vinyl chloride	100	U	1000	965		ug/L		96	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 130*
4-Bromofluorobenzene (Surr)	*92*		*47 - 134*
Toluene-d8 (Surr)	*88*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144483-A-2 MS
Matrix: Water
Analysis Batch: 473762

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*98*		*78 - 129*

Lab Sample ID: 240-144483-A-2 MSD
Matrix: Water
Analysis Batch: 473762

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	91	J	1000	1030		ug/L		94	64 - 132	7	35
cis-1,2-Dichloroethene	100	U	1000	976		ug/L		98	68 - 121	2	35
Tetrachloroethene	100	U	1000	1120		ug/L		112	52 - 129	1	35
trans-1,2-Dichloroethene	100	U	1000	997		ug/L		100	69 - 126	5	35
Trichloroethene	1900		1000	2640		ug/L		75	56 - 124	1	35
Vinyl chloride	100	U	1000	903		ug/L		90	49 - 136	7	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*75 - 130*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*
Toluene-d8 (Surr)	*90*		*69 - 122*
Dibromofluoromethane (Surr)	*90*		*78 - 129*

Lab Sample ID: MB 240-476776/7
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/15/21 15:40	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/15/21 15:40	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/15/21 15:40	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/15/21 15:40	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/15/21 15:40	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/15/21 15:40	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*75 - 130*		*03/15/21 15:40*	*1*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*		*03/15/21 15:40*	*1*
Toluene-d8 (Surr)	*98*		*69 - 122*		*03/15/21 15:40*	*1*
Dibromofluoromethane (Surr)	*81*		*78 - 129*		*03/15/21 15:40*	*1*

Lab Sample ID: LCS 240-476776/4
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,1-Dichloroethene			10.0	8.48		ug/L		85	73 - 129		
cis-1,2-Dichloroethene			10.0	9.17		ug/L		92	75 - 124		
Tetrachloroethene			10.0	10.2		ug/L		102	70 - 125		
trans-1,2-Dichloroethene			10.0	8.93		ug/L		89	74 - 130		
Trichloroethene			10.0	8.97		ug/L		90	71 - 121		

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-476776/4
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Vinyl chloride			10.0	11.1		ug/L		111	61 - 134		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*78*		*75 - 130*
4-Bromofluorobenzene (Surr)	*94*		*47 - 134*
Toluene-d8 (Surr)	*97*		*69 - 122*
Dibromofluoromethane (Surr)	*83*		*78 - 129*

Lab Sample ID: 190-25454-E-1 MS
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,1-Dichloroethene	1.0	U	10.0	6.81		ug/L		68	64 - 132		
cis-1,2-Dichloroethene	1.0	U	10.0	7.96		ug/L		80	68 - 121		
Tetrachloroethene	1.0	U	10.0	8.88		ug/L		89	52 - 129		
trans-1,2-Dichloroethene	1.0	U	10.0	7.48		ug/L		75	69 - 126		
Trichloroethene	1.0	U	10.0	7.78		ug/L		78	56 - 124		
Vinyl chloride	1.0	U	10.0	9.92		ug/L		99	49 - 136		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*75 - 130*
4-Bromofluorobenzene (Surr)	*97*		*47 - 134*
Toluene-d8 (Surr)	*95*		*69 - 122*
Dibromofluoromethane (Surr)	*83*		*78 - 129*

Lab Sample ID: 190-25454-F-1 MSD
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	6.82		ug/L		68	64 - 132	0	35
cis-1,2-Dichloroethene	1.0	U	10.0	8.09		ug/L		81	68 - 121	2	35
Tetrachloroethene	1.0	U	10.0	8.78		ug/L		88	52 - 129	1	35
trans-1,2-Dichloroethene	1.0	U	10.0	7.87		ug/L		79	69 - 126	5	35
Trichloroethene	1.0	U	10.0	8.10		ug/L		81	56 - 124	4	35
Vinyl chloride	1.0	U	10.0	10.4		ug/L		104	49 - 136	4	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*95*		*69 - 122*
Dibromofluoromethane (Surr)	*86*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473604/5
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 12:27	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/18/21 12:27*	*1*

Lab Sample ID: LCS 240-473604/4
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.5		ug/L		105	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

Lab Sample ID: 240-144425-C-2 MS
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	11.1		ug/L		111	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144425-C-2 MSD
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.7		ug/L		107	46 - 170	3	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

GC/MS VOA

Analysis Batch: 473604

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144502-2	MW-148S_021121	Total/NA	Water	8260B SIM	
MB 240-473604/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-473604/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144425-C-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144425-C-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 473762

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144502-2	MW-148S_021121	Total/NA	Water	8260B	
MB 240-473762/7	Method Blank	Total/NA	Water	8260B	
LCS 240-473762/4	Lab Control Sample	Total/NA	Water	8260B	
240-144483-A-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144483-A-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 476776

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144502-1	TRIP BLANK	Total/NA	Water	8260B	
MB 240-476776/7	Method Blank	Total/NA	Water	8260B	
LCS 240-476776/4	Lab Control Sample	Total/NA	Water	8260B	
190-25454-E-1 MS	Matrix Spike	Total/NA	Water	8260B	
190-25454-F-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144502-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144502-1

Date Collected: 02/11/21 00:00

Matrix: Water

Date Received: 02/13/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	476776	03/15/21 16:05	LRW	TAL CAN

Client Sample ID: MW-148S_021121

Lab Sample ID: 240-144502-2

Date Collected: 02/11/21 13:40

Matrix: Water

Date Received: 02/13/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473762	02/19/21 22:09	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	473604	02/18/21 21:17	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144502-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

MICHIGAN 190 TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	DW NPDES RCRA Other	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
Address: 28550 Cabot Drive, Suite 500		Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377		Sampler Name: Emma Witherspoon	TAT if different from below		Walk-in client
Phone: 248-994-2240		Method of Shipment/Carrier:	10 day — 3 weeks / 2 weeks / 1 week / 2 days / 1 day		Lab sampling
Project Name: Ford LTP Off-Site		Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04					
PO # 30050315.402.04					

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-1485-021121	2/11/21	1340		6						6					N	G	X	X	X	X	X	X	X	3 vocs for 8260B 3 vocs for 8260B SIM

240-144502 Chain of Custody

Possible Hazard Identification: Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / Disposal By Lab / Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Witherspoon	Arcadis	2/11/21 1700	Novi Cold Storage	Arcadis	2/11/21 1700
Julia McClafferty	Arcadis	2/12/2021	Amanda Battistel	ETA	2/12/21 10:05
Amanda Battistel	ETA	2/12/21 11:01	Received in Laboratory by:	Company:	Date/Time:
				ETA	2-13-21 800

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3/26/2021 (Rev. 1)

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 144502**
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Ryan C

Cooler Received on 2-13-21 Opened on 2-13-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: ~~Bubble Wrap~~ Foam Plastic Bag None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.5 °C Corrected Cooler Temp. 1.6 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC907861
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 59072	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

_____

_____

_____

_____

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

March 26, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144502-1
Sample date: 2021-02-11
Report received by CADENA: 2021-03-26
Initial Data Verification completed by CADENA: 2021-03-26
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

HTQ - GCMS VOC sample TRIP BLANK analysis was performed outside of reference holding time due to an initial sample mix-up so all associated results should be considered to be estimated and qualified with UJ flags if non-detect.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Qualified Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144502-1

Sample Name: TRIP BLANK
Lab Sample ID: 2401445021
Sample Date: 2/11/2021

Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC					
OSW-8260B					
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	UJ
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	UJ
Tetrachloroethene	127-18-4	ND	1.0	ug/l	UJ
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	UJ
Trichloroethene	79-01-6	ND	1.0	ug/l	UJ
Vinyl chloride	75-01-4	ND	1.0	ug/l	UJ

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144502-1

		Sample Name:	TRIP BLANK				MW-148S_021121			
		Lab Sample ID:	2401445021				2401445022			
		Sample Date:	2/11/2021				2/11/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	UJ	1.2	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

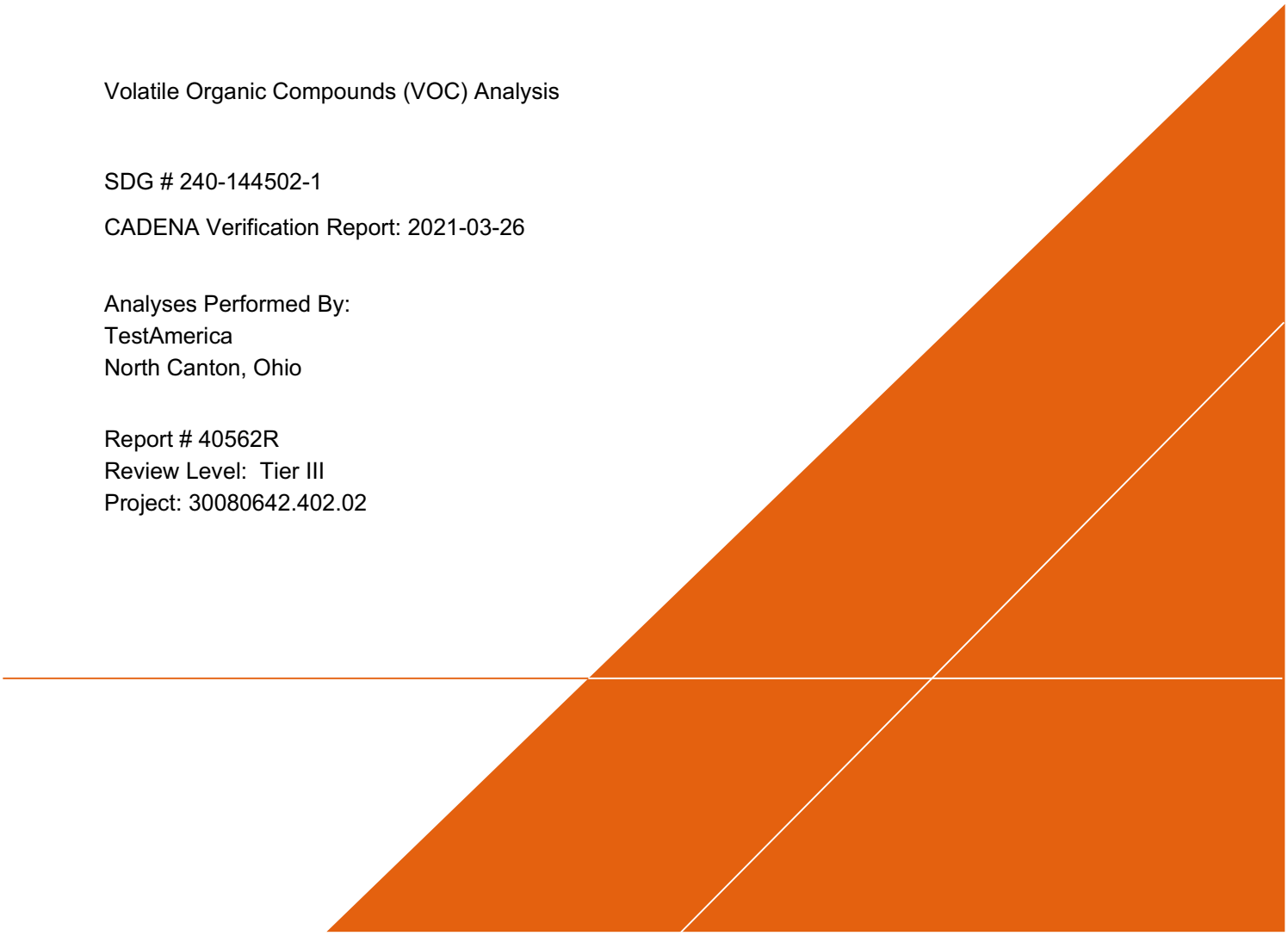
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144502-1

CADENA Verification Report: 2021-03-26

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40562R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144502-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144502-1	Water	02/11/2021		X	
MW-148S_021121	240-144502-2	Water	02/11/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

The analyses that exceeded the holding are presented in the following table.

Sample ID	Holding Time	Criteria
TRIP BLANK	32 days	14 days from collection to analysis

Sample results associated with samples mentioned in the table above, analyzed by analytical method SW-846 8260B were qualified, as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

DATA REVIEW

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X	X		
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

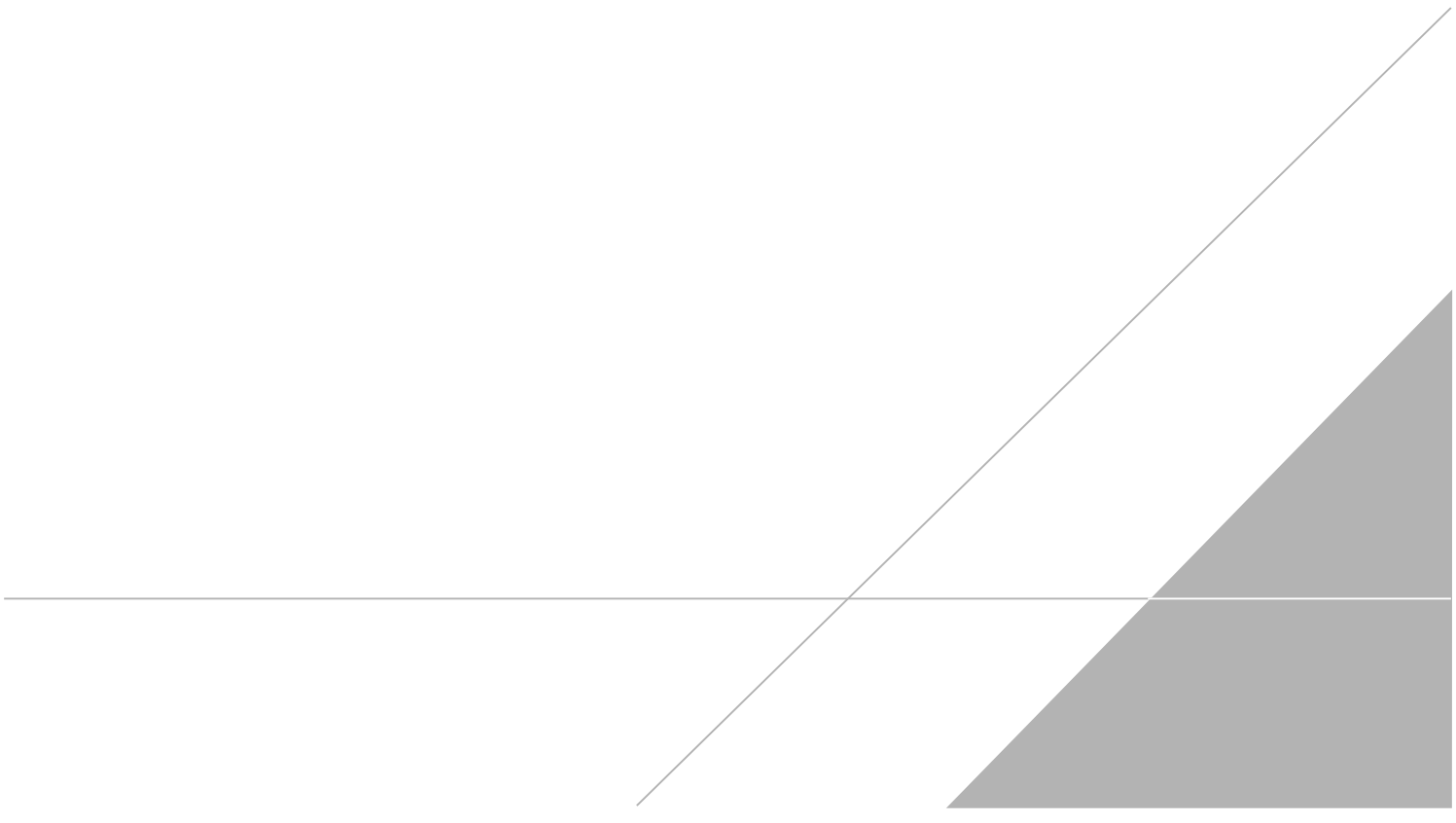
DATE: March 30, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 30, 2021

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



Chain of Custody Record

MICHIGAN 190 TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Emma Witherspoon		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below

10 day: 3 weeks / ✓ 2 weeks / 1 week / 2 days / 1 day

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM					Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X					1 Trip blank
MW-1485-021121	2/11/21	1340		6						6					N	G	X	X	X	X	X	X	X					3 vcas for 8260B 3vcas for 8260B SIM

240-144502 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client ✓ Disposal By Lab Archive For Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Witherspoon	Arcadis	2/11/21 1700	Novi Cold Storage	Arcadis	2/11/21 1700
Julia McClafferty	Arcadis	2/12/2021	Amanda Battehill	ETA	2/12/21 10:05
Amanda Battehill	ETA	2/12/21 11:01	Received in Laboratory by: [signature]	ETA	2-13-21 800

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144502-1

Date Collected: 02/11/21 00:00
Matrix: Water
Date Received: 02/13/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
~~1,1-Dichloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.19~~	~~ug/L~~			~~03/15/21 16:05~~		R 1
~~cis-1,2-Dichloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.16~~	~~ug/L~~			~~03/15/21 16:05~~		R 1
~~Tetrachloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.15~~	~~ug/L~~			~~03/15/21 16:05~~		R 1
~~trans-1,2-Dichloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.19~~	~~ug/L~~			~~03/15/21 16:05~~		R 1
~~Trichloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.10~~	~~ug/L~~			~~03/15/21 16:05~~		R 1
~~Vinyl chloride~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.20~~	~~ug/L~~			~~03/15/21 16:05~~		R 1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*75 - 130*		*03/15/21 16:05*	*1*
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*		*03/15/21 16:05*	*1*
Toluene-d8 (Surr)	*97*		*69 - 122*		*03/15/21 16:05*	*1*
Dibromofluoromethane (Surr)	*86*		*78 - 129*		*03/15/21 16:05*	*1*

Client Sample ID: MW-148S_021121
Lab Sample ID: 240-144502-2

Date Collected: 02/11/21 13:40
Matrix: Water
Date Received: 02/13/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 21:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*		*02/18/21 21:17*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/19/21 22:09	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/19/21 22:09	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/19/21 22:09	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/19/21 22:09	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/19/21 22:09	1
Vinyl chloride	**1.2**		1.0	0.20	ug/L			02/19/21 22:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*109*		*75 - 130*		*02/19/21 22:09*	*1*
4-Bromofluorobenzene (Surr)	*67*		*47 - 134*		*02/19/21 22:09*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*02/19/21 22:09*	*1*
Dibromofluoromethane (Surr)	*115*		*78 - 129*		*02/19/21 22:09*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144570-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
2/28/2021 2:00:20 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144570-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144570-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144570-1

Comments
No additional comments.

Receipt
The samples were received on 2/17/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.9° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144570-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144570-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144570-1	TRIP BLANK	Water	02/12/21 00:00	02/17/21 08:00	
240-144570-2	MW-117S_021221	Water	02/12/21 14:45	02/17/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144570-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144570-1

No Detections.

Client Sample ID: MW-117S_021221 — Lab Sample ID: 240-144570-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	0.16	J	1.0	0.16	ug/L	1		8260B	Total/NA
Trichloroethene	0.36	J	1.0	0.10	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144570-1

Client Sample ID: TRIP BLANK

Date Collected: 02/12/21 00:00
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144570-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 13:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/23/21 13:46	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 13:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 13:46	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/23/21 13:46	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/23/21 13:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*02/23/21 13:46*	*1*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*		*02/23/21 13:46*	*1*
Toluene-d8 (Surr)	*98*		*69 - 122*		*02/23/21 13:46*	*1*
Dibromofluoromethane (Surr)	*101*		*78 - 129*		*02/23/21 13:46*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144570-1

Client Sample ID: MW-117S_021221
Date Collected: 02/12/21 14:45
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144570-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 17:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/22/21 17:51*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 14:08	1
cis-1,2-Dichloroethene	**0.16**	**J**	1.0	0.16	ug/L			02/23/21 14:08	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 14:08	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 14:08	1
Trichloroethene	**0.36**	**J**	1.0	0.10	ug/L			02/23/21 14:08	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/23/21 14:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*02/23/21 14:08*	*1*
4-Bromofluorobenzene (Surr)	*85*		*47 - 134*		*02/23/21 14:08*	*1*
Toluene-d8 (Surr)	*97*		*69 - 122*		*02/23/21 14:08*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*02/23/21 14:08*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144570-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144570-1	TRIP BLANK	100	88	98	101
240-144570-2	MW-117S_021221	101	85	97	98
240-144576-D-2 MS	Matrix Spike	97	96	103	97
240-144576-E-2 MSD	Matrix Spike Duplicate	95	93	98	97
LCS 240-474092/4	Lab Control Sample	101	103	105	109
MB 240-474092/6	Method Blank	98	87	101	98

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144518-M-2 MS	Matrix Spike	84
240-144518-M-2 MSD	Matrix Spike Duplicate	84
240-144570-2	MW-117S_021221	83
LCS 240-473970/4	Lab Control Sample	80
MB 240-473970/5	Method Blank	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474092/6
Matrix: Water
Analysis Batch: 474092

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 11:10	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/23/21 11:10	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 11:10	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 11:10	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/23/21 11:10	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/23/21 11:10	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 130*		*02/23/21 11:10*	*1*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*		*02/23/21 11:10*	*1*
Toluene-d8 (Surr)	*101*		*69 - 122*		*02/23/21 11:10*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*02/23/21 11:10*	*1*

Lab Sample ID: LCS 240-474092/4
Matrix: Water
Analysis Batch: 474092

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.9		ug/L		109	73 - 129
cis-1,2-Dichloroethene	10.0	10.8		ug/L		108	75 - 124
Tetrachloroethene	10.0	11.7		ug/L		117	70 - 125
trans-1,2-Dichloroethene	10.0	10.6		ug/L		106	74 - 130
Trichloroethene	10.0	10.4		ug/L		104	71 - 121
Vinyl chloride	10.0	11.4		ug/L		114	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*
Toluene-d8 (Surr)	*105*		*69 - 122*
Dibromofluoromethane (Surr)	*109*		*78 - 129*

Lab Sample ID: 240-144576-D-2 MS
Matrix: Water
Analysis Batch: 474092

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.00		ug/L		90	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	9.45		ug/L		95	68 - 121
Tetrachloroethene	1.0	U	10.0	8.55		ug/L		85	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.17		ug/L		92	69 - 126
Trichloroethene	1.0	U	10.0	9.03		ug/L		90	56 - 124
Vinyl chloride	1.0	U	10.0	9.58		ug/L		96	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*
Toluene-d8 (Surr)	*103*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144576-D-2 MS
Matrix: Water
Analysis Batch: 474092

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	97		78 - 129

Lab Sample ID: 240-144576-E-2 MSD
Matrix: Water
Analysis Batch: 474092

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.58		ug/L		96	64 - 132	6	35
cis-1,2-Dichloroethene	1.0	U	10.0	9.91		ug/L		99	68 - 121	5	35
Tetrachloroethene	1.0	U	10.0	10.1		ug/L		101	52 - 129	17	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.82		ug/L		98	69 - 126	7	35
Trichloroethene	1.0	U	10.0	10.2		ug/L		102	56 - 124	12	35
Vinyl chloride	1.0	U	10.0	10.5		ug/L		105	49 - 136	9	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	95		75 - 130
4-Bromofluorobenzene (Surr)	93		47 - 134
Toluene-d8 (Surr)	98		69 - 122
Dibromofluoromethane (Surr)	97		78 - 129

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473970/5
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 14:03	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	81		70 - 133		02/22/21 14:03	1

Lab Sample ID: LCS 240-473970/4
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.3		ug/L		103	80 - 135

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	80		70 - 133

Lab Sample ID: 240-144518-M-2 MS
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	10.3		ug/L		103	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*

Lab Sample ID: 240-144518-M-2 MSD
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.4		ug/L		104	46 - 170	1	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*

GC/MS VOA

Analysis Batch: 473970

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144570-2	MW-117S_021221	Total/NA	Water	8260B SIM	
MB 240-473970/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-473970/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144518-M-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144518-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474092

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144570-1	TRIP BLANK	Total/NA	Water	8260B	
240-144570-2	MW-117S_021221	Total/NA	Water	8260B	
MB 240-474092/6	Method Blank	Total/NA	Water	8260B	
LCS 240-474092/4	Lab Control Sample	Total/NA	Water	8260B	
240-144576-D-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144576-E-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144570-1

Client Sample ID: TRIP BLANK
Date Collected: 02/12/21 00:00
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144570-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474092	02/23/21 13:46	LEE	TAL CAN

Client Sample ID: MW-117S_021221
Date Collected: 02/12/21 14:45
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144570-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474092	02/23/21 14:08	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	473970	02/22/21 17:51	SAM	TAL CAN

Laboratory References:
TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144570-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190 TestAmerica

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COC#
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; 3 weeks, ✓ 2 weeks, — 1 week, 2 days, 1 day		Walk-in client; Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30050315.402.04	Shipping/Tracking No:			
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-117502122 1	2/12/21	1445		6						6					N	G	X	X	X	X	X	X	X	3 vials for 8260B 3 vials for 8260B SIM

240-144570 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard — Flammable — Skin Irritant — Poison B — Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client — ✓ Disposal By Lab — Archive For — Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by: Witherspoon	Arcadis	2/12/21 1700	Novi cold storage	Arcadis	2/12/21 1700
Relinquished by: Heather Allen	ARCADIS	2/15/21 1010	Amanda Battenfield	ETA	2/15/21 1010
Relinquished by: Amanda Battenfield	ETA	2/15/21 10:57	Received in Laboratory by:	Company:	Date/Time:

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Amanda Battenfield ETA 2/16/21 907 COLD STORAGE ETA 2/15/21 10:57

ETA 2-17-21 800

2/28/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 445720**
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: MattSnyder

Cooler Received on 2-17-21 Opened on 2-17-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: ~~Bubble Wrap~~ Foam Plastic Bag None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 0.8 °C Corrected Cooler Temp 0.9 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity _____	(Yes) No	
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes) No NA	
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes (No)	
-Were tamper/custody seals intact and uncompromised?	(Yes) No NA	
3. Shippers' packing slip attached to the cooler(s)?	(Yes) No	
4. Did custody papers accompany the sample(s)?	(Yes) No	
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes) No	
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes) No	
7. Did all bottles arrive in good condition (Unbroken)?	(Yes) No	
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes) No	
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes) No	
11. Sufficient quantity received to perform indicated analyses?	(Yes) No	
12. Are these work share samples and all listed on the COC?	Yes (No)	
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No (NA)	pH Strip Lot# HC907861
14. Were VOAs on the COC?	(Yes) No	
15. Were air bubbles >6 mm in any VOA vials? ● ⇐ Larger than this.	Yes (No) NA	
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____	(Yes) No	
17. Was a LL Hg or Me Hg trip blank present? _____	Yes (No)	

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

February 28, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144570-1
Sample date: 2021-02-12
Report received by CADENA: 2021-02-28
Initial Data Verification completed by CADENA: 2021-02-28
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144570-1

		Sample Name:	TRIP BLANK				MW-117S_021221			
		Lab Sample ID:	2401445701				2401445702			
		Sample Date:	2/12/2021				2/12/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	0.16	1.0	ug/l	J
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	0.36	1.0	ug/l	J
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

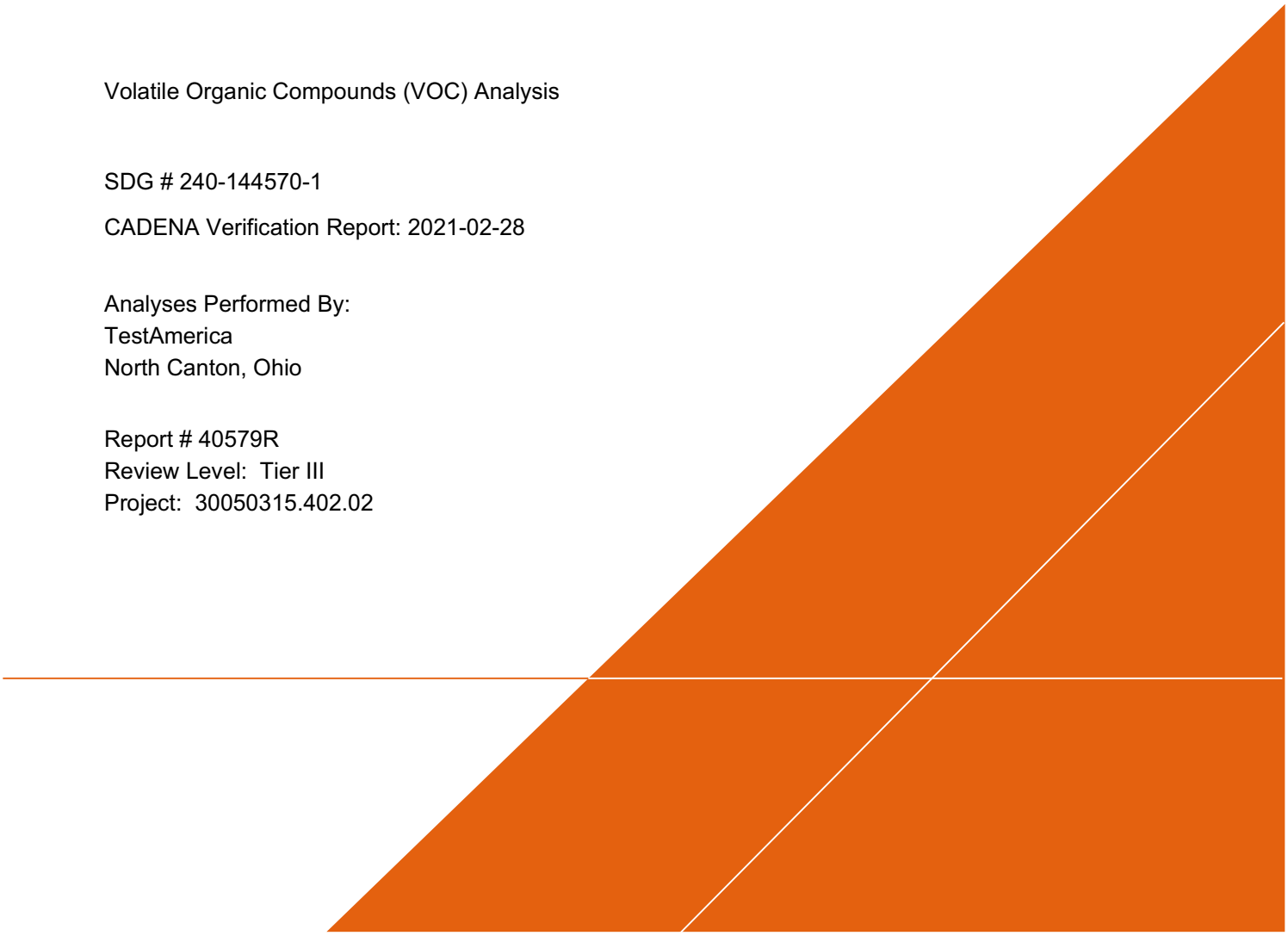
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144570-1

CADENA Verification Report: 2021-02-28

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40579R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144570-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144570-1	Water	02/12/2021		X	
MW-117S_021221	240-144570-2	Water	02/12/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 17, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 18, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Emma Witherspoon		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below

10 day ✓ 3 weeks / 2 weeks / 1 week / 2 days / 1 day

Analyses

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM					Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X					1 Trip blank
MW-117S021221	2/12/21	1445		6						6					N	G	X	X	X	X	X	X	X					3 vcas for 8260B 3 vcas for 8260B SIM

240-144570 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client ✓ Disposal By Lab Archive For Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Witherspoon	Arcadis	2/12/21 1700	Novi Cold Storage	Arcadis	2/12/21 1700
[signature]	ARCADIS	2/15/21 1010	[signature]	ETA	2/15/21 1010
[signature]	ETA	2/15/21 10:57	Received in Laboratory by:	Company:	Date/Time:

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COLD STORAGE ETA 2/15/21 10:57

[signature] ETA 2/16/21 907 [signature] ETA 2-17-21 800

02/28/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144570-1

Date Collected: 02/12/21 00:00
Matrix: Water
Date Received: 02/17/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 13:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/23/21 13:46	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 13:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 13:46	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/23/21 13:46	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/23/21 13:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*02/23/21 13:46*	*1*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*		*02/23/21 13:46*	*1*
Toluene-d8 (Surr)	*98*		*69 - 122*		*02/23/21 13:46*	*1*
Dibromofluoromethane (Surr)	*101*		*78 - 129*		*02/23/21 13:46*	*1*

Client Sample ID: MW-117S_021221
Lab Sample ID: 240-144570-2

Date Collected: 02/12/21 14:45
Matrix: Water
Date Received: 02/17/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 17:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/22/21 17:51*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 14:08	1
cis-1,2-Dichloroethene	**0.16**	**J**	1.0	0.16	ug/L			02/23/21 14:08	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 14:08	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 14:08	1
Trichloroethene	**0.36**	**J**	1.0	0.10	ug/L			02/23/21 14:08	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/23/21 14:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*02/23/21 14:08*	*1*
4-Bromofluorobenzene (Surr)	*85*		*47 - 134*		*02/23/21 14:08*	*1*
Toluene-d8 (Surr)	*97*		*69 - 122*		*02/23/21 14:08*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*02/23/21 14:08*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144425-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
2/24/2021 11:12:19 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144425-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
F1	MS and/or MSD recovery exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144425-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144425-1

Comments
No additional comments.

Receipt
The samples were received on 2/12/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.4º C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) associated with batch 473378 recovered above the upper control limit for 1,1-Dichloroethene. The samples associated with this CCV were non-detect for the affected analyte; therefore, the data have been reported. The associated samples are impacted: TRIP BLANK (240-144425-1) and MW-151S_021021 (240-144425-2).

Method 8260B: The laboratory control sample (LCS) for 473378 recovered outside control limits for the following analyte: 1,1-Dichloroethene. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported: TRIP BLANK (240-144425-1), MW-151S_021021 (240-144425-2) and (LCS 240-473378/4).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144425-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144425-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144425-1	TRIP BLANK	Water	02/10/21 00:00	02/12/21 08:00	
240-144425-2	MW-151S_021021	Water	02/10/21 16:14	02/12/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144425-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144425-1

No Detections.

Client Sample ID: MW-151S_021021 — Lab Sample ID: 240-144425-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	0.76	J	1.0	0.20	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144425-1

Client Sample ID: TRIP BLANK
Date Collected: 02/10/21 00:00
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144425-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/17/21 11:08	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 11:08	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 11:08	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 11:08	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 11:08	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 11:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*75 - 130*		*02/17/21 11:08*	*1*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*		*02/17/21 11:08*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*02/17/21 11:08*	*1*
Dibromofluoromethane (Surr)	*101*		*78 - 129*		*02/17/21 11:08*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144425-1

Client Sample ID: MW-151S_021021
Date Collected: 02/10/21 16:14
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144425-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 17:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/18/21 17:05*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/17/21 11:29	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 11:29	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 11:29	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 11:29	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 11:29	1
Vinyl chloride	**0.76**	**J**	1.0	0.20	ug/L			02/17/21 11:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*75 - 130*		*02/17/21 11:29*	*1*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*		*02/17/21 11:29*	*1*
Toluene-d8 (Surr)	*89*		*69 - 122*		*02/17/21 11:29*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*02/17/21 11:29*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144425-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144425-1	TRIP BLANK	112	88	90	101
240-144425-2	MW-151S_021021	116	87	89	99
240-144433-A-2 MS	Matrix Spike	108	108	96	96
240-144433-E-2 MSD	Matrix Spike Duplicate	106	108	97	96
LCS 240-473378/4	Lab Control Sample	108	109	99	98
MB 240-473378/7	Method Blank	112	88	88	96

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144425-2	MW-151S_021021	83
240-144425-2 MS	MW-151S_021021	82
240-144425-2 MSD	MW-151S_021021	81
LCS 240-473604/4	Lab Control Sample	81
MB 240-473604/5	Method Blank	80

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473378/7
Matrix: Water
Analysis Batch: 473378

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 10:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 10:46	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 10:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 10:46	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 10:46	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 10:46	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*75 - 130*		*02/17/21 10:46*	*1*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*		*02/17/21 10:46*	*1*
Toluene-d8 (Surr)	*88*		*69 - 122*		*02/17/21 10:46*	*1*
Dibromofluoromethane (Surr)	*96*		*78 - 129*		*02/17/21 10:46*	*1*

Lab Sample ID: LCS 240-473378/4
Matrix: Water
Analysis Batch: 473378

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	15.6	*+	ug/L		156	73 - 129
cis-1,2-Dichloroethene	10.0	9.70		ug/L		97	75 - 124
Tetrachloroethene	10.0	9.82		ug/L		98	70 - 125
trans-1,2-Dichloroethene	10.0	9.77		ug/L		98	74 - 130
Trichloroethene	10.0	9.22		ug/L		92	71 - 121
Vinyl chloride	10.0	7.79		ug/L		78	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*108*		*75 - 130*
4-Bromofluorobenzene (Surr)	*109*		*47 - 134*
Toluene-d8 (Surr)	*99*		*69 - 122*
Dibromofluoromethane (Surr)	*98*		*78 - 129*

Lab Sample ID: 240-144433-A-2 MS
Matrix: Water
Analysis Batch: 473378

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U F1 *+	10.0	16.4	F1	ug/L		164	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	8.88		ug/L		89	68 - 121
Tetrachloroethene	1.0	U	10.0	8.79		ug/L		88	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	8.74		ug/L		87	69 - 126
Trichloroethene	1.0	U	10.0	8.38		ug/L		84	56 - 124
Vinyl chloride	1.0	U	10.0	6.85		ug/L		69	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*108*		*75 - 130*
4-Bromofluorobenzene (Surr)	*108*		*47 - 134*
Toluene-d8 (Surr)	*96*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144433-A-2 MS
Matrix: Water
Analysis Batch: 473378

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*96*		*78 - 129*

Lab Sample ID: 240-144433-E-2 MSD
Matrix: Water
Analysis Batch: 473378

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U F1 *+	10.0	13.8	F1	ug/L		138	64 - 132	18	35
cis-1,2-Dichloroethene	1.0	U	10.0	8.85		ug/L		89	68 - 121	0	35
Tetrachloroethene	1.0	U	10.0	8.74		ug/L		87	52 - 129	1	35
trans-1,2-Dichloroethene	1.0	U	10.0	8.79		ug/L		88	69 - 126	1	35
Trichloroethene	1.0	U	10.0	8.35		ug/L		83	56 - 124	0	35
Vinyl chloride	1.0	U	10.0	6.56		ug/L		66	49 - 136	4	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*106*		*75 - 130*
4-Bromofluorobenzene (Surr)	*108*		*47 - 134*
Toluene-d8 (Surr)	*97*		*69 - 122*
Dibromofluoromethane (Surr)	*96*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473604/5
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 12:27	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/18/21 12:27*	*1*

Lab Sample ID: LCS 240-473604/4
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.5		ug/L		105	80 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

Lab Sample ID: 240-144425-2 MS
Matrix: Water
Analysis Batch: 473604

Client Sample ID: MW-151S_021021
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	11.1		ug/L		111	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144425-2 MSD
Matrix: Water
Analysis Batch: 473604

Client Sample ID: MW-151S_021021
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.7		ug/L		107	46 - 170	3	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144425-1

GC/MS VOA

Analysis Batch: 473378

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144425-1	TRIP BLANK	Total/NA	Water	8260B	
240-144425-2	MW-151S_021021	Total/NA	Water	8260B	
MB 240-473378/7	Method Blank	Total/NA	Water	8260B	
LCS 240-473378/4	Lab Control Sample	Total/NA	Water	8260B	
240-144433-A-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144433-E-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 473604

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144425-2	MW-151S_021021	Total/NA	Water	8260B SIM	
MB 240-473604/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-473604/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144425-2 MS	MW-151S_021021	Total/NA	Water	8260B SIM	
240-144425-2 MSD	MW-151S_021021	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144425-1

Client Sample ID: TRIP BLANK
Date Collected: 02/10/21 00:00
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144425-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473378	02/17/21 11:08	LEE	TAL CAN

Client Sample ID: MW-151S_021021
Date Collected: 02/10/21 16:14
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144425-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473378	02/17/21 11:29	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	473604	02/18/21 17:05	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144425-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

MICHIGAN 190

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Andrew Banitt		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below: 10 day; 3 weeks; 2 weeks; 1 week; 2 days; 1 day

Analyses

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	2/10/21	—		1						1					N	G	X	X	X	X	X	X	X	Trip Blank
MW-1515_021021	2/10/21	1614		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-144425 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	2/10/21 1725	Novi Cold storage	Arcadis	2/10/21 1725
[signature]	ARCADIS	2/11/21 /0953	[signature]	ETA	2/11/21 0953
			Received in Laboratory by: [signature]	ETA	2-12-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 14425**
Canton Facility

Client Arcadis Site Name

Cooler Received on 2-12-21 Opened on 2-12-21 800

Cooler unpacked by: Ryan C

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☑ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 0-3 °C Corrected Cooler Temp. 0-4 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 3 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No RAC 2-12-21
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 59072 (Yes) No
17. Was a LL Hg or Me Hg trip blank present? ____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT



February 24, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144425-1
Sample date: 2021-02-10
Report received by CADENA: 2021-02-24
Initial Data Verification completed by CADENA: 2021-02-24
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 473378 LCS recoveries were outliers biased high for the following analyte: 1,1-DICHLOROETHENE. Associated client sample results were non-detect so qualification was not required based on this high bias QC outlier.

GCMS VOC QC batch MS/MSD recovery outliers were not determined using a client sample so qualification was not required based on these sample-specific QC outliers.

GCMS VOC QC batch CCV response outliers as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, MS/MSD Recovery, MS/MSD RPD, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144425-1

		Sample Name:	TRIP BLANK				MW-151S_021021			
		Lab Sample ID:	2401444251				2401444252			
		Sample Date:	2/10/2021				2/10/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	0.76	1.0	ug/l	J
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS Design & Consultancy for natural and built assets

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

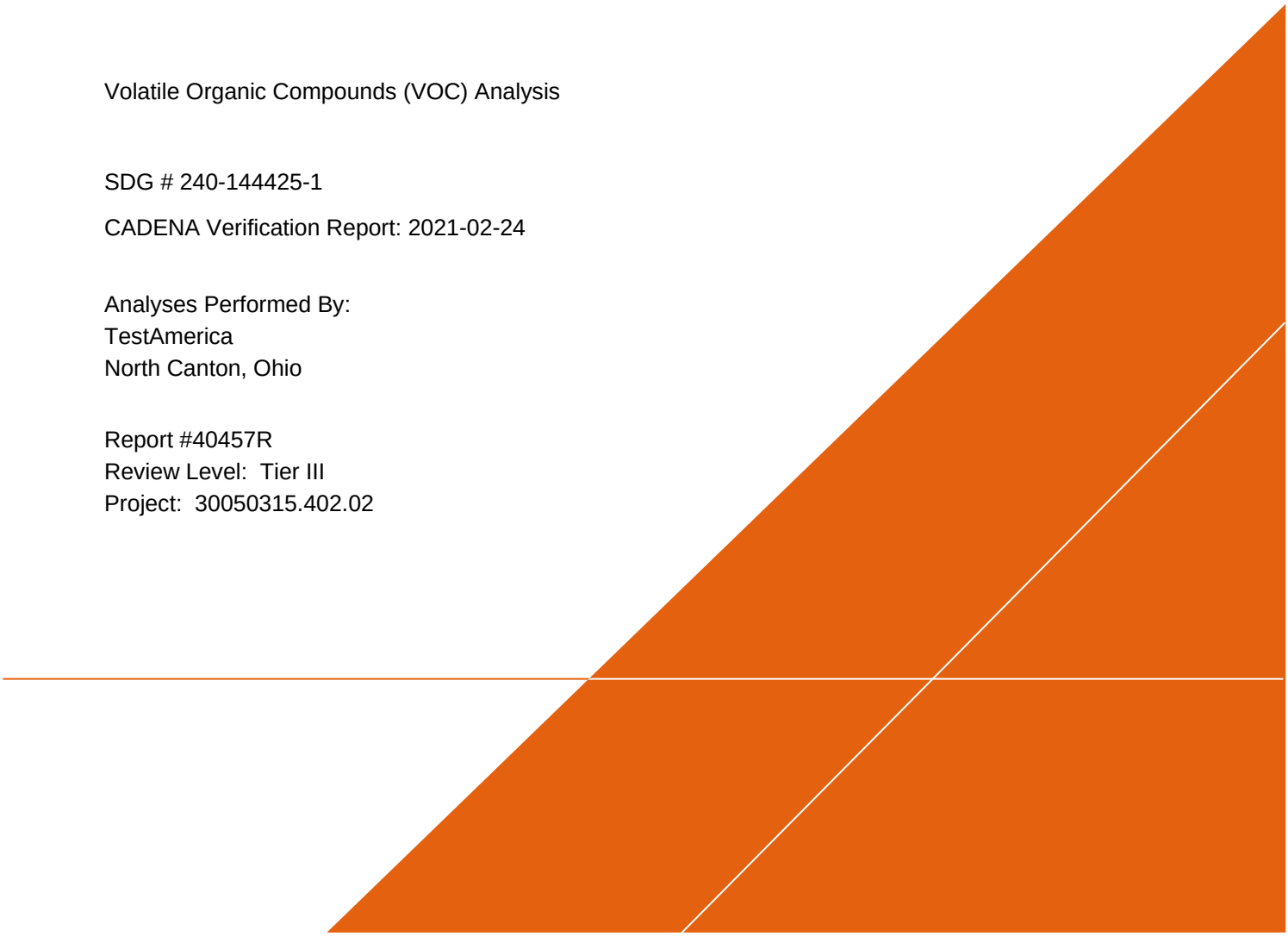
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144425-1

CADENA Verification Report: 2021-02-24

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report #40457R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144425-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					VOC
TRIP BLANK	240-144425-1	Water	02/10/2021		X
MW-151S_021021	240-144425-2	Water	02/10/2021		X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial/Continuing	Compound	Criteria
TRIP BLANK MW-151S_021021	CCV %D	1,1-Dichloroethene	+49.0%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J

DATA REVIEW

Initial/Continuing	Criteria	Sample Result	Qualification
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1] RRF of 0.01 only applies to compounds which are typically poor responding compounds (i.e., ketones, 1,4-dioxane, etc.)

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Prashanth K

SIGNATURE: 

DATE: March 08, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 10, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Andrew Banitt		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below

10 day ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day

Sample Identification	Sample Date	Sample Time	Matrix: Air	Matrix: Aqueous	Matrix: Sediment	Matrix: Solid	Matrix: Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM					Sample Specific Notes / Special Instructions:
TRIP BLANK	2/10/21	—		1						1					N	G	X	X	X	X	X	X	X					Trip Blank
MW-1515_021021	2/10/21	1614		6						6					N	G	X	X	X	X	X	X	X					3 VOAs for 8260B 3 VOAs for 8260B SIM

240-144425 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	2/10/21 1725	Novi Cold storage	Arcadis	2/10/21 1725
[signature]	ARCADIS	2/11/21 /0953	[signature]	ETA	2/11/21 0953
			Received in Laboratory by: [signature]	ETA	2-12-21 800

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02/24/2021

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144425-1

Date Collected: 02/10/21 00:00
Date Received: 02/12/21 08:00

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/17/21 11:08	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 11:08	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 11:08	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 11:08	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 11:08	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 11:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*75 - 130*		*02/17/21 11:08*	*1*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*		*02/17/21 11:08*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*02/17/21 11:08*	*1*
Dibromofluoromethane (Surr)	*101*		*78 - 129*		*02/17/21 11:08*	*1*

Client Sample ID: MW-151S_021021

Lab Sample ID: 240-144425-2

Date Collected: 02/10/21 16:14
Date Received: 02/12/21 08:00

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 17:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/18/21 17:05*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/17/21 11:29	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 11:29	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 11:29	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 11:29	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 11:29	1
Vinyl chloride	**0.76**	**J**	1.0	0.20	ug/L			02/17/21 11:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*75 - 130*		*02/17/21 11:29*	*1*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*		*02/17/21 11:29*	*1*
Toluene-d8 (Surr)	*89*		*69 - 122*		*02/17/21 11:29*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*02/17/21 11:29*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144567-2
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/3/2021 10:26:46 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144567-2

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144567-2

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144567-2

Comments
No additional comments.

Receipt
The samples were received on 2/17/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.5° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144567-2

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144567-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144567-2	MW-156S_021521	Water	02/15/21 10:28	02/17/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144567-2

Client Sample ID: MW-156S_021521

Lab Sample ID: 240-144567-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Trichloroethene	0.14	J	1.0	0.10	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144567-2

Client Sample ID: MW-156S_021521

Date Collected: 02/15/21 10:28
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144567-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/24/21 18:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*		*02/24/21 18:10*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 14:56	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 14:56	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 14:56	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 14:56	1
Trichloroethene	**0.14**	**J**	1.0	0.10	ug/L			02/24/21 14:56	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 14:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 130*		*02/24/21 14:56*	*1*
4-Bromofluorobenzene (Surr)	*98*		*47 - 134*		*02/24/21 14:56*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*02/24/21 14:56*	*1*
Dibromofluoromethane (Surr)	*89*		*78 - 129*		*02/24/21 14:56*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144567-2

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144567-2	MW-156S_021521	87	98	93	89
240-144568-D-2 MS	Matrix Spike	87	98	93	89
240-144568-E-2 MSD	Matrix Spike Duplicate	86	100	92	91
LCS 240-474307/4	Lab Control Sample	84	101	92	89
MB 240-474307/7	Method Blank	87	103	92	89

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144567-2	MW-156S_021521	86
240-144568-J-2 MS	Matrix Spike	81
240-144568-J-2 MSD	Matrix Spike Duplicate	82
LCS 240-474283/4	Lab Control Sample	84
MB 240-474283/5	Method Blank	86

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474307/7
Matrix: Water
Analysis Batch: 474307

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 14:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 14:06	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 14:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 14:06	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 14:06	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 14:06	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 130*		*02/24/21 14:06*	*1*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*		*02/24/21 14:06*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*02/24/21 14:06*	*1*
Dibromofluoromethane (Surr)	*89*		*78 - 129*		*02/24/21 14:06*	*1*

Lab Sample ID: LCS 240-474307/4
Matrix: Water
Analysis Batch: 474307

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.71		ug/L		97	73 - 129
cis-1,2-Dichloroethene	10.0	10.6		ug/L		106	75 - 124
Tetrachloroethene	10.0	9.87		ug/L		99	70 - 125
trans-1,2-Dichloroethene	10.0	10.3		ug/L		103	74 - 130
Trichloroethene	10.0	9.93		ug/L		99	71 - 121
Vinyl chloride	10.0	11.5		ug/L		115	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*
4-Bromofluorobenzene (Surr)	*101*		*47 - 134*
Toluene-d8 (Surr)	*92*		*69 - 122*
Dibromofluoromethane (Surr)	*89*		*78 - 129*

Lab Sample ID: 240-144568-D-2 MS
Matrix: Water
Analysis Batch: 474307

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.77		ug/L		98	64 - 132
cis-1,2-Dichloroethene	0.43	J	10.0	10.1		ug/L		97	68 - 121
Tetrachloroethene	1.0	U	10.0	9.57		ug/L		96	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.78		ug/L		98	69 - 126
Trichloroethene	1.0	U	10.0	9.70		ug/L		97	56 - 124
Vinyl chloride	1.0	U	10.0	11.4		ug/L		114	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 130*
4-Bromofluorobenzene (Surr)	*98*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144568-D-2 MS
Matrix: Water
Analysis Batch: 474307

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*89*		*78 - 129*

Lab Sample ID: 240-144568-E-2 MSD
Matrix: Water
Analysis Batch: 474307

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.63		ug/L		96	64 - 132	1	35
cis-1,2-Dichloroethene	0.43	J	10.0	10.2		ug/L		98	68 - 121	1	35
Tetrachloroethene	1.0	U	10.0	8.84		ug/L		88	52 - 129	8	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.59		ug/L		96	69 - 126	2	35
Trichloroethene	1.0	U	10.0	9.53		ug/L		95	56 - 124	2	35
Vinyl chloride	1.0	U	10.0	11.7		ug/L		117	49 - 136	2	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*
4-Bromofluorobenzene (Surr)	*100*		*47 - 134*
Toluene-d8 (Surr)	*92*		*69 - 122*
Dibromofluoromethane (Surr)	*91*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474283/5
Matrix: Water
Analysis Batch: 474283

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/24/21 11:01	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*		*02/24/21 11:01*	*1*

Lab Sample ID: LCS 240-474283/4
Matrix: Water
Analysis Batch: 474283

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.5		ug/L		105	80 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*

Lab Sample ID: 240-144568-J-2 MS
Matrix: Water
Analysis Batch: 474283

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	9.90		ug/L		99	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

Lab Sample ID: 240-144568-J-2 MSD
Matrix: Water
Analysis Batch: 474283

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.89		ug/L		99	46 - 170	0	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144567-2

GC/MS VOA

Analysis Batch: 474283

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144567-2	MW-156S_021521	Total/NA	Water	8260B SIM	
MB 240-474283/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474283/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144568-J-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144568-J-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474307

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144567-2	MW-156S_021521	Total/NA	Water	8260B	
MB 240-474307/7	Method Blank	Total/NA	Water	8260B	
LCS 240-474307/4	Lab Control Sample	Total/NA	Water	8260B	
240-144568-D-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144568-E-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144567-2

Client Sample ID: MW-156S_021521
Date Collected: 02/15/21 10:28
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144567-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474307	02/24/21 14:56	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474283	02/24/21 18:10	SAM	TAL CAN

Laboratory References:
TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144567-2

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

0.4/6.5

Chain of Custody Record

MICHIGAN 190

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Kara Donahue		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below

10 day: 3 weeks / 2 weeks / 1 week / 2 days / 1 day

Analyses

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-156S_021521	2/15/21	1028		6						6					N	G	X	X	X	X	X	X	X	3 VOAS for 8260B 3 VOAS for 8260B SIM
MW-118S_021521	2/15/21	1228		6						6					N	G	X	X	X	X	X	X	X	
MW-223S_021521	2/15/21	1508		6						6					N	G	X	X	X	X	X	X	X	

240-144567 Chain of Custody

Possible Hazard Identification: Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / Disposal By Lab / Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Kara Donahue	Arcadis	2/15/21 1653	Novi Cold Storage	Arcadis	2/15/21 1653
Christine Ulen	ARCADIS	2/16/21 / 1009	Amanda Battershell	ETA	2/16/21 / 10:09
Amanda Battershell	ETA	2/16/21 12:40	Received in Laboratory by: [signature]	ETA	2-17-21 800

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3/3/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 144567**
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: MathSmc

Cooler Received on 2-17-21 Opened on 2-17-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # NA Foam Box Client Cooler Box Other _____

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 0.4 °C Corrected Cooler Temp. 0.5 °C

IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   - -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   - -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   - -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? (Yes) No
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)? (Y) (Y) (Y)
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# **HC907861**
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #_____ (Yes) No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

March 03, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144567-2
Sample date: 2021-02-15
Report received by CADENA: 2021-03-03
Initial Data Verification completed by CADENA: 2021-03-03
Number of Samples:1
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144567-2

Sample Name: MW-156S_021521
Lab Sample ID: 2401445672
Sample Date: 2/15/2021

Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC					
OSW-8260B					
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---
Trichloroethene	79-01-6	0.14	1.0	ug/l	J
Vinyl chloride	75-01-4	ND	1.0	ug/l	---
OSW-8260BBSim					
1,4-Dioxane	123-91-1	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

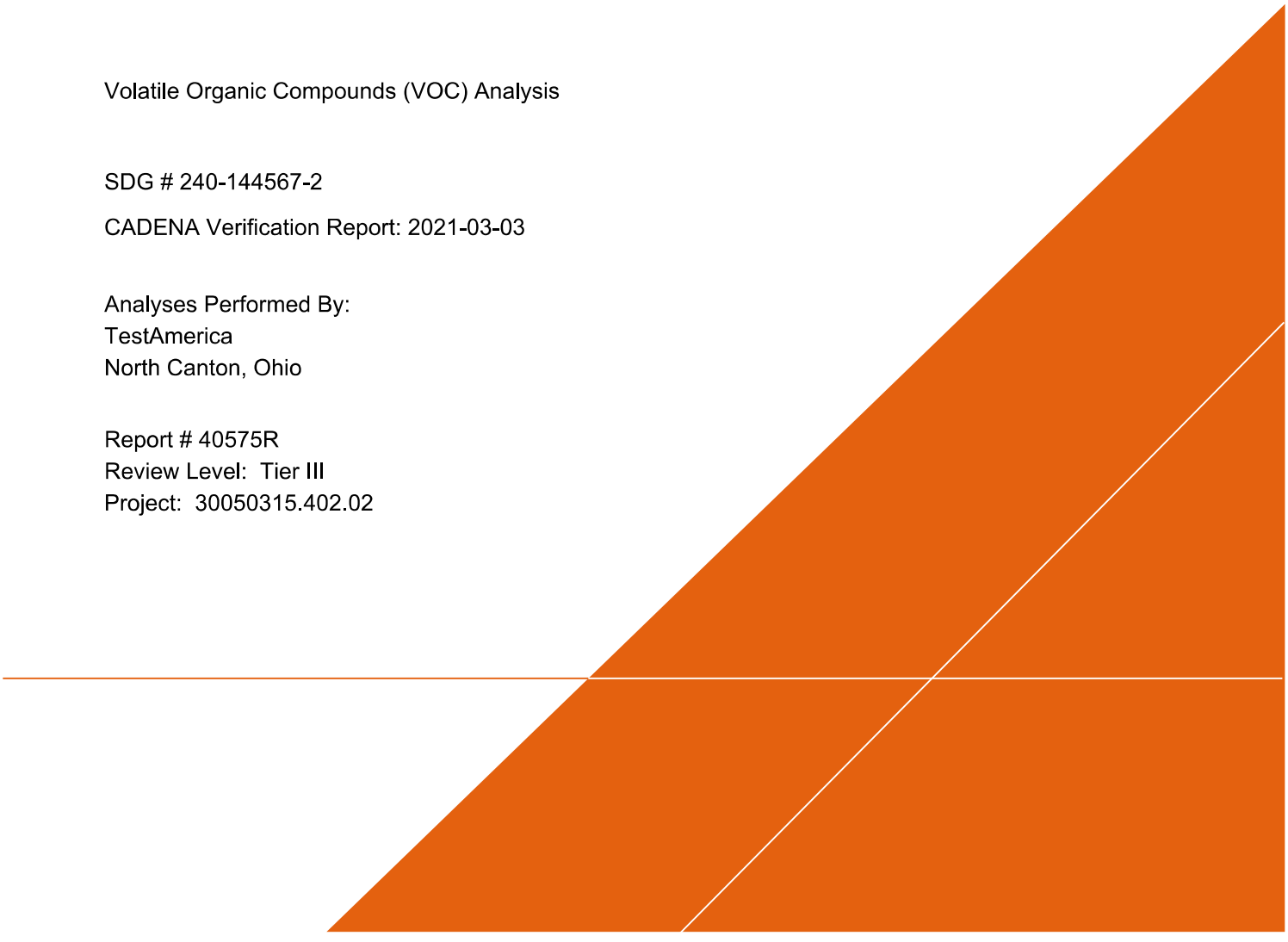
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144567-2

CADENA Verification Report: 2021-03-03

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40575R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144567-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
MW-156S_021521	240-144567-2	Water	02/15/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 17, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

0.4/6.5

Chain of Custody Record

MICHIGAN 190

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Kara Donahue	TAT if different from below: 10 day; 3 weeks; 2 weeks; 1 week; 2 days; 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-156S_021521	2/15/21	1028		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B; 3 VOAs for 8260B SIM
MW-118S_021521	2/15/21	1228		6						6					N	G	X	X	X	X	X	X	X	
MW-223S_021521	2/15/21	1508		6						6					N	G	X	X	X	X	X	X	X	

240-144567 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Kara Donahue	Arcadis	2/15/21 1653	Novi Cold Storage	Arcadis	2/15/21 1653
Christopher Utter	ARCADIS	2/16/21 1009	Amanda Battershell	ETA	2/16/21 10:09
Amanda Battershell	ETA	2/16/21 12:40	Received in Laboratory by:	Company:	Date/Time:
				ETA	2-17-21 800

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03/03/2021

Client Sample ID: MW-156S_021521
Lab Sample ID: 240-144567-2

Date Collected: 02/15/21 10:28
Matrix: Water
Date Received: 02/17/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/24/21 18:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*		*02/24/21 18:10*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 14:56	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 14:56	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 14:56	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 14:56	1
Trichloroethene	**0.14**	**J**	1.0	0.10	ug/L			02/24/21 14:56	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 14:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 130*		*02/24/21 14:56*	*1*
4-Bromofluorobenzene (Surr)	*98*		*47 - 134*		*02/24/21 14:56*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*02/24/21 14:56*	*1*
Dibromofluoromethane (Surr)	*89*		*78 - 129*		*02/24/21 14:56*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144431-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
2/24/2021 11:14:26 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144431-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
F1	MS and/or MSD recovery exceeds control limits.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144431-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144431-1

Comments
No additional comments.

Receipt
The samples were received on 2/12/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.4º C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) associated with batch 473378 recovered above the upper control limit for 1,1-Dichloroethene. The samples associated with this CCV were non-detect for the affected analyte; therefore, the data have been reported. The associated samples are impacted: TRIP BLANK (240-144431-1) and MW-171S_021021 (240-144431-2).

Method 8260B: The laboratory control sample (LCS) for 473378 recovered outside control limits for the following analyte: 1,1-Dichloroethene. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported: TRIP BLANK (240-144431-1), MW-171S_021021 (240-144431-2) and (LCS 240-473378/4).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144431-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144431-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144431-1	TRIP BLANK	Water	02/10/21 00:00	02/12/21 08:00	
240-144431-2	MW-171S_021021	Water	02/10/21 13:35	02/12/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144431-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144431-1

No Detections.

Client Sample ID: MW-171S_021021 — Lab Sample ID: 240-144431-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144431-1

Client Sample ID: TRIP BLANK
Date Collected: 02/10/21 00:00
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144431-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/17/21 14:02	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 14:02	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 14:02	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 14:02	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 14:02	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 14:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*75 - 130*		*02/17/21 14:02*	*1*
4-Bromofluorobenzene (Surr)	*82*		*47 - 134*		*02/17/21 14:02*	*1*
Toluene-d8 (Surr)	*88*		*69 - 122*		*02/17/21 14:02*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*02/17/21 14:02*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144431-1

Client Sample ID: MW-171S_021021
Date Collected: 02/10/21 13:35
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144431-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 19:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*78*		*70 - 133*		*02/18/21 19:36*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/17/21 14:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 14:24	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 14:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 14:24	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 14:24	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 14:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*75 - 130*		*02/17/21 14:24*	*1*
4-Bromofluorobenzene (Surr)	*83*		*47 - 134*		*02/17/21 14:24*	*1*
Toluene-d8 (Surr)	*87*		*69 - 122*		*02/17/21 14:24*	*1*
Dibromofluoromethane (Surr)	*102*		*78 - 129*		*02/17/21 14:24*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144431-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144431-1	TRIP BLANK	117	82	88	103
240-144431-2	MW-171S_021021	119	83	87	102
240-144433-A-2 MS	Matrix Spike	108	108	96	96
240-144433-E-2 MSD	Matrix Spike Duplicate	106	108	97	96
LCS 240-473378/4	Lab Control Sample	108	109	99	98
MB 240-473378/7	Method Blank	112	88	88	96

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144425-C-2 MS	Matrix Spike	82
240-144425-C-2 MSD	Matrix Spike Duplicate	81
240-144431-2	MW-171S_021021	78
LCS 240-473604/4	Lab Control Sample	81
MB 240-473604/5	Method Blank	80

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473378/7
Matrix: Water
Analysis Batch: 473378

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 10:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 10:46	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 10:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 10:46	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 10:46	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 10:46	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*75 - 130*		*02/17/21 10:46*	*1*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*		*02/17/21 10:46*	*1*
Toluene-d8 (Surr)	*88*		*69 - 122*		*02/17/21 10:46*	*1*
Dibromofluoromethane (Surr)	*96*		*78 - 129*		*02/17/21 10:46*	*1*

Lab Sample ID: LCS 240-473378/4
Matrix: Water
Analysis Batch: 473378

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	15.6	*+	ug/L		156	73 - 129
cis-1,2-Dichloroethene	10.0	9.70		ug/L		97	75 - 124
Tetrachloroethene	10.0	9.82		ug/L		98	70 - 125
trans-1,2-Dichloroethene	10.0	9.77		ug/L		98	74 - 130
Trichloroethene	10.0	9.22		ug/L		92	71 - 121
Vinyl chloride	10.0	7.79		ug/L		78	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*108*		*75 - 130*
4-Bromofluorobenzene (Surr)	*109*		*47 - 134*
Toluene-d8 (Surr)	*99*		*69 - 122*
Dibromofluoromethane (Surr)	*98*		*78 - 129*

Lab Sample ID: 240-144433-A-2 MS
Matrix: Water
Analysis Batch: 473378

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U F1 *+	10.0	16.4	F1	ug/L		164	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	8.88		ug/L		89	68 - 121
Tetrachloroethene	1.0	U	10.0	8.79		ug/L		88	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	8.74		ug/L		87	69 - 126
Trichloroethene	1.0	U	10.0	8.38		ug/L		84	56 - 124
Vinyl chloride	1.0	U	10.0	6.85		ug/L		69	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*108*		*75 - 130*
4-Bromofluorobenzene (Surr)	*108*		*47 - 134*
Toluene-d8 (Surr)	*96*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144433-A-2 MS
Matrix: Water
Analysis Batch: 473378

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*96*		*78 - 129*

Lab Sample ID: 240-144433-E-2 MSD
Matrix: Water
Analysis Batch: 473378

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U F1 *+	10.0	13.8	F1	ug/L		138	64 - 132	18	35
cis-1,2-Dichloroethene	1.0	U	10.0	8.85		ug/L		89	68 - 121	0	35
Tetrachloroethene	1.0	U	10.0	8.74		ug/L		87	52 - 129	1	35
trans-1,2-Dichloroethene	1.0	U	10.0	8.79		ug/L		88	69 - 126	1	35
Trichloroethene	1.0	U	10.0	8.35		ug/L		83	56 - 124	0	35
Vinyl chloride	1.0	U	10.0	6.56		ug/L		66	49 - 136	4	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*106*		*75 - 130*
4-Bromofluorobenzene (Surr)	*108*		*47 - 134*
Toluene-d8 (Surr)	*97*		*69 - 122*
Dibromofluoromethane (Surr)	*96*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473604/5
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 12:27	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/18/21 12:27*	*1*

Lab Sample ID: LCS 240-473604/4
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.5		ug/L		105	80 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

Lab Sample ID: 240-144425-C-2 MS
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	11.1		ug/L		111	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144425-C-2 MSD
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.7		ug/L		107	46 - 170	3	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144431-1

GC/MS VOA

Analysis Batch: 473378

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144431-1	TRIP BLANK	Total/NA	Water	8260B	
240-144431-2	MW-171S_021021	Total/NA	Water	8260B	
MB 240-473378/7	Method Blank	Total/NA	Water	8260B	
LCS 240-473378/4	Lab Control Sample	Total/NA	Water	8260B	
240-144433-A-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144433-E-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 473604

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144431-2	MW-171S_021021	Total/NA	Water	8260B SIM	
MB 240-473604/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-473604/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144425-C-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144425-C-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144431-1

Client Sample ID: TRIP BLANK
Date Collected: 02/10/21 00:00
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144431-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473378	02/17/21 14:02	LEE	TAL CAN

Client Sample ID: MW-171S_021021
Date Collected: 02/10/21 13:35
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144431-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473378	02/17/21 14:24	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	473604	02/18/21 19:36	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144431-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN T90

TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	DW NPDES RCRA Other	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
Address: 28550 Cabot Drive, Suite 500		Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377		Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Phone: 248-994-2240		Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site		Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04					
PO # 30050315.402.04					

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 TRIP BLANK
MW-171S_021021	2/10/21	1335		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-144431 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: E Witherspoon	Arcadis	2/10/21 / 1700	Received by: Novi cold storage	Arcadis	2/10/21 / 1700
Relinquished by:	ARCADIS	2/11/21 / 0953	Received by:	ETA	2/11/21 / 0953
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company: ETA	Date/Time: 2-12-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 144431**
Canton Facility

Client Arcadis Site Name

Cooler Received on 2-12-21 Opened on 2-12-21 800

Cooler unpacked by: Ryan C

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☑ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 0.3 °C Corrected Cooler Temp. 0.4 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 3	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No RAC 2.12.21
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 59072	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

REVISED REPORT: February 25, 2021
REVISION SUMMARY: Data table (ARS) revised to correct sample ID.

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144431-1
Sample date: 2021-02-10
Report received by CADENA: 2021-02-24
Initial Data Verification completed by CADENA: 2021-02-24
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 473378 LCS recoveries were outliers biased high for the following analyte: 1,1-DICHLOROETHENE. Associated client sample results were non-detect so qualification was not required based on this high bias QC outlier.

GCMS VOC QC batch MS/MSD recovery outliers were not determined using a client sample so qualification was not required based on these sample-specific QC outliers.

GCMS VOC QC batch CCV response outliers as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144431-1

		Sample Name:	TRIP BLANK				MW-171S_021021			
		Lab Sample ID:	2401444311				2401444312			
		Sample Date:	2/10/2021				2/10/2021			
Analyte	**Cas No.**	**Result**	**Report Limit**	**Units**	**Valid Qualifier**	**Result**	**Report Limit**	**Units**	**Valid Qualifier**
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

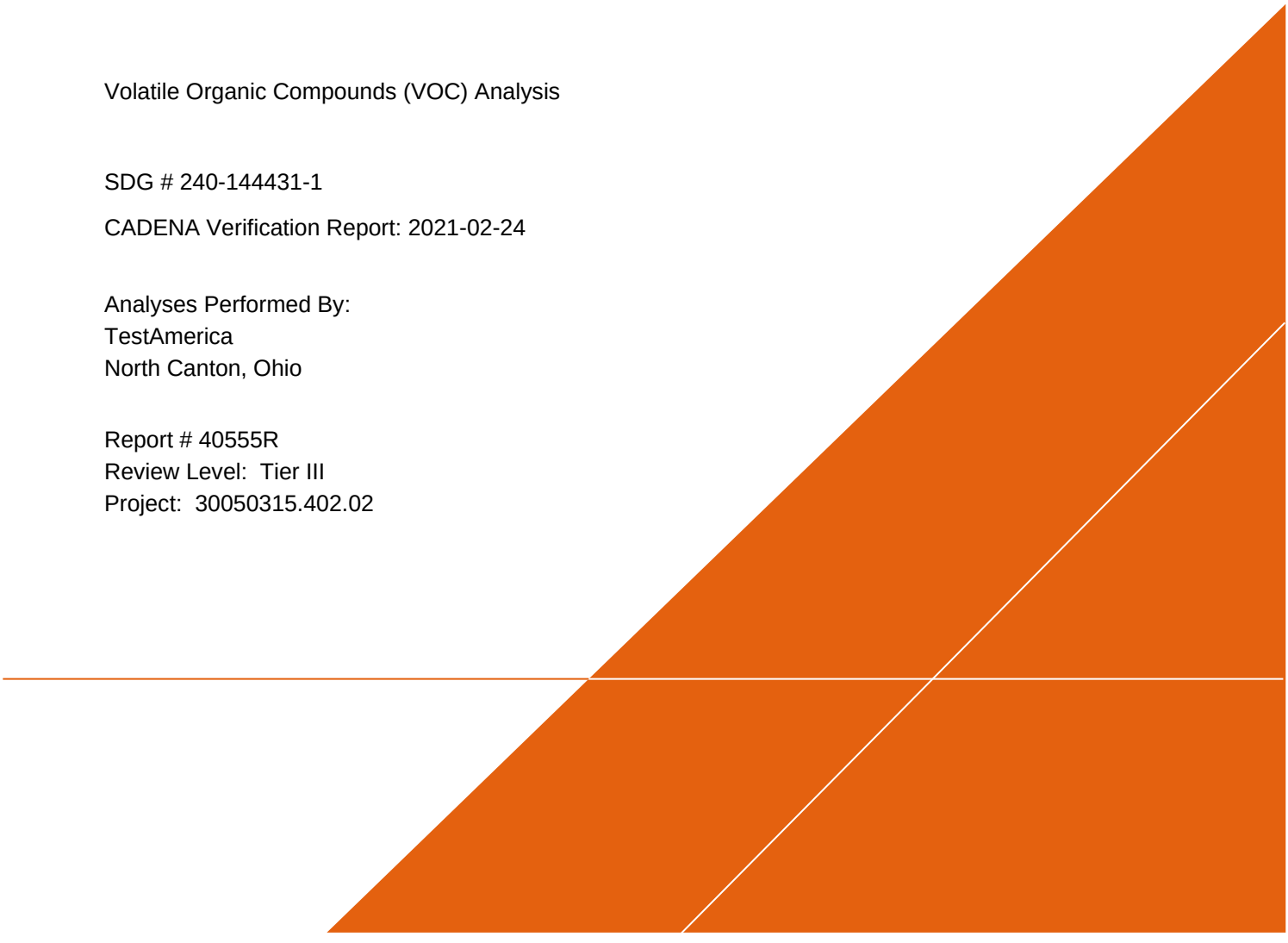
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144431-1

CADENA Verification Report: 2021-02-24

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40555R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144431-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144431-1	Water	02/10/2021		X	
MW-171S_021021	240-144431-2	Water	02/10/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial/Continuing	Compound	Criteria
TRIP BLANK MW-171S_021021	CCV %D	1,1-Dichloroethene	+49.0%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J

Initial/Continuing	Criteria	Sample Result	Qualification
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1] RRF of 0.01 only applies to compounds which are typically poor responding compounds (i.e., ketones, 1,4-dioxane, etc.)

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

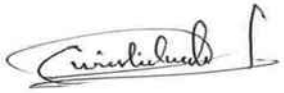
%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 17, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

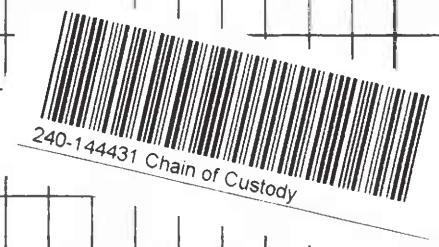
MICHIGAN T90

TestAmerica

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 TRIP BLANK
MW-171S_021021	2/10/21	1335		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM



Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Emma Witherspoon	Arcadis	2/10/21 1700	Novi cold storage	Arcadis	2/10/21 1700
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	ARCADIS	2/11/21 0953	[signature]	ETA	2/11/21 0953
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
			[signature]	ETA	2-12-21 800

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144431-1
Date Collected: 02/10/21 00:00
Matrix: Water
Date Received: 02/12/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/17/21 14:02	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 14:02	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 14:02	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 14:02	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 14:02	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 14:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*75 - 130*		*02/17/21 14:02*	*1*
4-Bromofluorobenzene (Surr)	*82*		*47 - 134*		*02/17/21 14:02*	*1*
Toluene-d8 (Surr)	*88*		*69 - 122*		*02/17/21 14:02*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*02/17/21 14:02*	*1*

Client Sample ID: MW-171S_021021
Lab Sample ID: 240-144431-2
Date Collected: 02/10/21 13:35
Matrix: Water
Date Received: 02/12/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 19:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*78*		*70 - 133*		*02/18/21 19:36*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/17/21 14:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 14:24	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 14:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 14:24	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 14:24	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 14:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*75 - 130*		*02/17/21 14:24*	*1*
4-Bromofluorobenzene (Surr)	*83*		*47 - 134*		*02/17/21 14:24*	*1*
Toluene-d8 (Surr)	*87*		*69 - 122*		*02/17/21 14:24*	*1*
Dibromofluoromethane (Surr)	*102*		*78 - 129*		*02/17/21 14:24*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144567-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/3/2021 10:12:46 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144567-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
S1-	Surrogate recovery exceeds control limits, low biased.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144567-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144567-1

Comments
No additional comments.

Receipt
The samples were received on 2/17/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.5° C.

GC/MS VOA
Method 8260B: The laboratory control sample (LCS) for analytical batch 240-474305 recovered outside control limits for the following analyte: Tetrachloroethane. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data has been reported: TRIP BLANK (240-144567-1) and (LCS 240-474305/4).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144567-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144567-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144567-1	TRIP BLANK	Water	02/15/21 00:00	02/17/21 08:00	
240-144567-3	MW-118S_021521	Water	02/15/21 12:28	02/17/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144567-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144567-1

No Detections.

Client Sample ID: MW-118S_021521 — Lab Sample ID: 240-144567-3

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144567-1

Client Sample ID: TRIP BLANK
Date Collected: 02/15/21 00:00
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144567-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 21:53	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 21:53	1
Tetrachloroethene	1.0	U *+	1.0	0.15	ug/L			02/24/21 21:53	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 21:53	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 21:53	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 21:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*75 - 130*		*02/24/21 21:53*	*1*
4-Bromofluorobenzene (Surr)	*62*		*47 - 134*		*02/24/21 21:53*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*02/24/21 21:53*	*1*
Dibromofluoromethane (Surr)	*113*		*78 - 129*		*02/24/21 21:53*	*1*

Client Sample ID: MW-118S_021521
Date Collected: 02/15/21 12:28
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144567-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/24/21 18:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*		*02/24/21 18:36*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 15:21	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 15:21	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 15:21	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 15:21	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 15:21	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 15:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*75 - 130*		*02/24/21 15:21*	*1*
4-Bromofluorobenzene (Surr)	*98*		*47 - 134*		*02/24/21 15:21*	*1*
Toluene-d8 (Surr)	*94*		*69 - 122*		*02/24/21 15:21*	*1*
Dibromofluoromethane (Surr)	*88*		*78 - 129*		*02/24/21 15:21*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144567-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144567-1	TRIP BLANK	96	62	80	113
240-144567-3	MW-118S_021521	89	98	94	88
240-144568-B-3 MS	Matrix Spike	71 S1-	86	92	87
240-144568-D-2 MS	Matrix Spike	87	98	93	89
240-144568-E-2 MSD	Matrix Spike Duplicate	86	100	92	91
240-144568-E-3 MSD	Matrix Spike Duplicate	69 S1-	91	93	88
LCS 240-474305/4	Lab Control Sample	88	87	89	91
LCS 240-474307/4	Lab Control Sample	84	101	92	89
MB 240-474305/7	Method Blank	98	67	84	103
MB 240-474307/7	Method Blank	87	103	92	89

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144567-3	MW-118S_021521	86
240-144568-J-2 MS	Matrix Spike	81
240-144568-J-2 MSD	Matrix Spike Duplicate	82
LCS 240-474283/4	Lab Control Sample	84
MB 240-474283/5	Method Blank	86

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474305/7
Matrix: Water
Analysis Batch: 474305

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 14:13	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 14:13	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 14:13	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 14:13	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 14:13	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 14:13	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 130*		*02/24/21 14:13*	*1*
4-Bromofluorobenzene (Surr)	*67*		*47 - 134*		*02/24/21 14:13*	*1*
Toluene-d8 (Surr)	*84*		*69 - 122*		*02/24/21 14:13*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*02/24/21 14:13*	*1*

Lab Sample ID: LCS 240-474305/4
Matrix: Water
Analysis Batch: 474305

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.8		ug/L		108	73 - 129
cis-1,2-Dichloroethene	10.0	9.69		ug/L		97	75 - 124
Tetrachloroethene	10.0	12.6	*+	ug/L		126	70 - 125
trans-1,2-Dichloroethene	10.0	11.0		ug/L		110	74 - 130
Trichloroethene	10.0	10.3		ug/L		103	71 - 121
Vinyl chloride	10.0	9.04		ug/L		90	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 130*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*
Toluene-d8 (Surr)	*89*		*69 - 122*
Dibromofluoromethane (Surr)	*91*		*78 - 129*

Lab Sample ID: 240-144568-B-3 MS
Matrix: Water
Analysis Batch: 474305

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.41		ug/L		94	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	8.71		ug/L		87	68 - 121
Tetrachloroethene	1.0	U *+	10.0	11.6		ug/L		116	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.81		ug/L		98	69 - 126
Trichloroethene	1.0	U	10.0	9.03		ug/L		90	56 - 124
Vinyl chloride	1.0	U	10.0	8.44		ug/L		84	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*71*	*S1-*	*75 - 130*
4-Bromofluorobenzene (Surr)	*86*		*47 - 134*
Toluene-d8 (Surr)	*92*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144568-B-3 MS
Matrix: Water
Analysis Batch: 474305

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*87*		*78 - 129*

Lab Sample ID: 240-144568-E-3 MSD
Matrix: Water
Analysis Batch: 474305

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.22		ug/L		92	64 - 132	2	35
cis-1,2-Dichloroethene	1.0	U	10.0	8.56		ug/L		86	68 - 121	2	35
Tetrachloroethene	1.0	U *+	10.0	11.0		ug/L		110	52 - 129	6	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.16		ug/L		92	69 - 126	7	35
Trichloroethene	1.0	U	10.0	8.83		ug/L		88	56 - 124	2	35
Vinyl chloride	1.0	U	10.0	8.72		ug/L		87	49 - 136	3	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*69*	*S1-*	*75 - 130*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*88*		*78 - 129*

Lab Sample ID: MB 240-474307/7
Matrix: Water
Analysis Batch: 474307

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 14:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 14:06	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 14:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 14:06	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 14:06	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 14:06	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 130*		*02/24/21 14:06*	*1*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*		*02/24/21 14:06*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*02/24/21 14:06*	*1*
Dibromofluoromethane (Surr)	*89*		*78 - 129*		*02/24/21 14:06*	*1*

Lab Sample ID: LCS 240-474307/4
Matrix: Water
Analysis Batch: 474307

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.71		ug/L		97	73 - 129
cis-1,2-Dichloroethene	10.0	10.6		ug/L		106	75 - 124
Tetrachloroethene	10.0	9.87		ug/L		99	70 - 125
trans-1,2-Dichloroethene	10.0	10.3		ug/L		103	74 - 130
Trichloroethene	10.0	9.93		ug/L		99	71 - 121

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-474307/4
Matrix: Water
Analysis Batch: 474307

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Vinyl chloride			10.0	11.5		ug/L		115	61 - 134		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*
4-Bromofluorobenzene (Surr)	*101*		*47 - 134*
Toluene-d8 (Surr)	*92*		*69 - 122*
Dibromofluoromethane (Surr)	*89*		*78 - 129*

Lab Sample ID: 240-144568-D-2 MS
Matrix: Water
Analysis Batch: 474307

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,1-Dichloroethene	1.0	U	10.0	9.77		ug/L		98	64 - 132		
cis-1,2-Dichloroethene	0.43	J	10.0	10.1		ug/L		97	68 - 121		
Tetrachloroethene	1.0	U	10.0	9.57		ug/L		96	52 - 129		
trans-1,2-Dichloroethene	1.0	U	10.0	9.78		ug/L		98	69 - 126		
Trichloroethene	1.0	U	10.0	9.70		ug/L		97	56 - 124		
Vinyl chloride	1.0	U	10.0	11.4		ug/L		114	49 - 136		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 130*
4-Bromofluorobenzene (Surr)	*98*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*89*		*78 - 129*

Lab Sample ID: 240-144568-E-2 MSD
Matrix: Water
Analysis Batch: 474307

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.63		ug/L		96	64 - 132	1	35
cis-1,2-Dichloroethene	0.43	J	10.0	10.2		ug/L		98	68 - 121	1	35
Tetrachloroethene	1.0	U	10.0	8.84		ug/L		88	52 - 129	8	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.59		ug/L		96	69 - 126	2	35
Trichloroethene	1.0	U	10.0	9.53		ug/L		95	56 - 124	2	35
Vinyl chloride	1.0	U	10.0	11.7		ug/L		117	49 - 136	2	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*
4-Bromofluorobenzene (Surr)	*100*		*47 - 134*
Toluene-d8 (Surr)	*92*		*69 - 122*
Dibromofluoromethane (Surr)	*91*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474283/5
Matrix: Water
Analysis Batch: 474283

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/24/21 11:01	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*		*02/24/21 11:01*	*1*

Lab Sample ID: LCS 240-474283/4
Matrix: Water
Analysis Batch: 474283

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.5		ug/L		105	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*

Lab Sample ID: 240-144568-J-2 MS
Matrix: Water
Analysis Batch: 474283

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	9.90		ug/L		99	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

Lab Sample ID: 240-144568-J-2 MSD
Matrix: Water
Analysis Batch: 474283

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.89		ug/L		99	46 - 170	0	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144567-1

GC/MS VOA

Analysis Batch: 474283

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144567-3	MW-118S_021521	Total/NA	Water	8260B SIM	
MB 240-474283/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474283/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144568-J-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144568-J-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474305

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144567-1	TRIP BLANK	Total/NA	Water	8260B	
MB 240-474305/7	Method Blank	Total/NA	Water	8260B	
LCS 240-474305/4	Lab Control Sample	Total/NA	Water	8260B	
240-144568-B-3 MS	Matrix Spike	Total/NA	Water	8260B	
240-144568-E-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 474307

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144567-3	MW-118S_021521	Total/NA	Water	8260B	
MB 240-474307/7	Method Blank	Total/NA	Water	8260B	
LCS 240-474307/4	Lab Control Sample	Total/NA	Water	8260B	
240-144568-D-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144568-E-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144567-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144567-1

Date Collected: 02/15/21 00:00

Matrix: Water

Date Received: 02/17/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474305	02/24/21 21:53	LRW	TAL CAN

Client Sample ID: MW-118S_021521

Lab Sample ID: 240-144567-3

Date Collected: 02/15/21 12:28

Matrix: Water

Date Received: 02/17/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474307	02/24/21 15:21	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474283	02/24/21 18:36	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144567-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

0.4/6.5

Chain of Custody Record

MICHIGAN 190

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Kara Donahue		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below

10 day: 3 weeks / 2 weeks / 1 week / 2 days / 1 day

Analyses

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-156S_021521	2/15/21	1028		6						6					N	G	X	X	X	X	X	X	X	3 VOAS for 8260B 3 VOAS for 8260B SIM
MW-118S_021521	2/15/21	1228		6						6					N	G	X	X	X	X	X	X	X	
MW-223S_021521	2/15/21	1508		6						6					N	G	X	X	X	X	X	X	X	

240-144567 Chain of Custody

Possible Hazard Identification: Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / Disposal By Lab / Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Kara Donahue	Arcadis	2/15/21 1653	Novi Cold Storage	Arcadis	2/15/21 1653
Christine Ulen	ARCADIS	2/16/21 / 1009	Amanda Battershell	ETA	2/16/21 / 10:09
Amanda Battershell	ETA	2/16/21 12:40	Received in Laboratory by: [signature]	ETA	2-17-21 800

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3/3/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 144567**
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: MathSmith

Cooler Received on 2-17-21 Opened on 2-17-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # NA Foam Box Client Cooler Box Other _____

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 0.4 °C Corrected Cooler Temp. 0.5 °C

IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   - Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   - Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   - Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? (Yes) No
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)? (Y) (Y) (Y)
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# **HC907861**
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #_____ (Yes) No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

_____

_____

_____

_____

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

March 03, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144567-1
Sample date: 2021-02-15
Report received by CADENA: 2021-03-03
Initial Data Verification completed by CADENA: 2021-03-03
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 474305 LCS recovery was outlying biased high for the following analyte: TETRACHLOROETHENE. Associated client sample results were non-detect so qualification was not required based on this high bias QC outlier.

GCMS VOC QC batch MS/MSD surrogate recovery outliers were not determined using a client sample so qualification was not required based on these sample-specific QC outliers.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144567-1

		Sample Name:	TRIP BLANK				MW-118S_021521			
		Lab Sample ID:	2401445671				2401445673			
		Sample Date:	2/15/2021				2/15/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

SHALLOW LOW-FLOW GROUNDWATER SAMPLING FORM

Project No.	30050315.402.01	Well ID	MW-118S			Date	2-15-21
Project Name/Location		Ford LTP		Weather	14.0 degrees F and . The wind is blowing N at 8.1 mph.		
Measuring Pt. Description	Top of Casing	Screen Setting (ft-bmp)	2.5-12.5	Casing Diameter (in.)	2	Well Material	PVC
Static Water Level (ft-bmp)	6.42	Total Depth (ft-bmp)	12.43	Water Column (ft.)	6.01	Gallons in Well	0.98
		Pump Intake (ft-bmp)	7.92	Purge Method	Low-Flow	Sample Method	Grab
		Well Volumes Purged	1.59				
Sample Time: Label	12:28	Volume Purged	1.56 gallons	Replicate/Code No.	_	Sampled by	Kara Donahue
Purge Start	11:23						
Purge End	12:31						

Time	Minutes Elapsed between Readings	Flow Rate (mL/min) [100-300 mL/min]	Depth to Water (ft) [±0.3]	Total Gallons Purged	pH [± 0.1]	Cond. (mS/cm) [± 3%]	Turbidity (NTU) [± 10%*]	DO (mg/L) [± 10%]	Temp. (°C) [± 3%]	Redox (mV) [± 10mV]	Appearance	
											Color	Odor
11:25	0	100	6.43	0.00	7.37	0.58	0.47	6.97	6.7	79.7	Clear	No Odor
11:30	5	100	6.43	0.13	7.29	0.68	0.98	3.23	7.0	76.2	Clear	No Odor
11:35	5	100	6.43	0.26	7.13	1.63	0.02	2.23	7.7	70.3	Clear	No Odor
11:40	5	100	6.43	0.39	7.15	1.67	0.02	1.59	7.7	47.8	Clear	No Odor
11:45	5	100	6.43	0.52	7.15	1.76	0.02	1.48	7.3	29.2	Clear	No Odor
11:50	5	100	6.43	0.65	7.15	1.81	0.02	1.55	7.5	15.6	Clear	No Odor
11:55	5	100	6.43	0.78	7.15	1.90	0.02	1.32	7.3	3.3	Clear	No Odor
12:00	5	100	6.43	0.91	7.14	1.99	0.02	1.21	7.7	-5.7	Clear	No Odor
12:05	5	100	6.43	1.04	7.14	2.13	0.02	1.21	7.6	-13.9	Clear	No Odor
12:10	5	100	6.43	1.17	7.13	2.19	0.02	1.13	7.5	-21.5	Clear	No Odor
12:15	5	100	6.43	1.30	7.13	2.24	0.02	1.12	7.7	-26.4	Clear	No Odor
12:20	5	100	6.43	1.43	7.13	2.26	0.02	1.06	7.7	-31.7	Clear	No Odor
12:25	5	100	6.43	1.56	7.12	2.30	0.02	1.09	7.8	-35.4	Clear	No Odor
_	_	_	_	_	_	_	_	_	_	_	_	_
_	_	_	_	_	_	_	_	_	_	_	_	_
_	_	_	_	_	_	_	_	_	_	_	_	_
_	_	_	_	_	_	_	_	_	_	_	_	_
_	_	_	_	_	_	_	_	_	_	_	_	_
_	_	_	_	_	_	_	_	_	_	_	_	_
_	_	_	_	_	_	_	_	_	_	_	_	_

* **Turbidity** < 50 NTU and ±10% or within 1 NTU of a previous reading when <10 NTU

Constituents Sampled	Container	Number	Preservative
1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, PCE, TCE, VC	40 mL Glass	3	HCL
1,4-dioxane	40 mL Glass	3	HCL

Comments

None

Well Casing Volumes

Gallons/Foot — *1" = 0.04* — *1.25" = 0.06* — *1.5" = 0.09* — *2" = 0.16* — *2.5" = 0.26* — *3" = 0.37* — *3.5" = 0.50* — *4" = 0.65* — *6" = 1.47*

Well Information

Well Location:	12124 Boston Post; front yard	Well Locked at Arrival:	yes
Condition of Well:	Fair	Well Locked at Departure:	yes
Well Completion:	Flush mount	Lock Functioning:	yes

ARCADIS

SHALLOW LOW-FLOW GROUNDWATER SAMPLING FORM

Project No.: 30050315.402.01 Page 1 of 1

Site Location: Ford LTP 12124 Boston Post; front yard

Prepared By: Kara Donahue

Date	Time	Description of Activities
2/15/2021	11:05	Arrive onsite
2/15/2021	23:15	Record static depth to water
2/15/2021	11:23	Begin purging well
2/15/2021	12:28	Collect sample MW-118S_021521
2/15/2021	12:31	End purge and turn off pump, begin decon of equipment
2/15/2021	12:40	Offsite
–	–	--
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ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

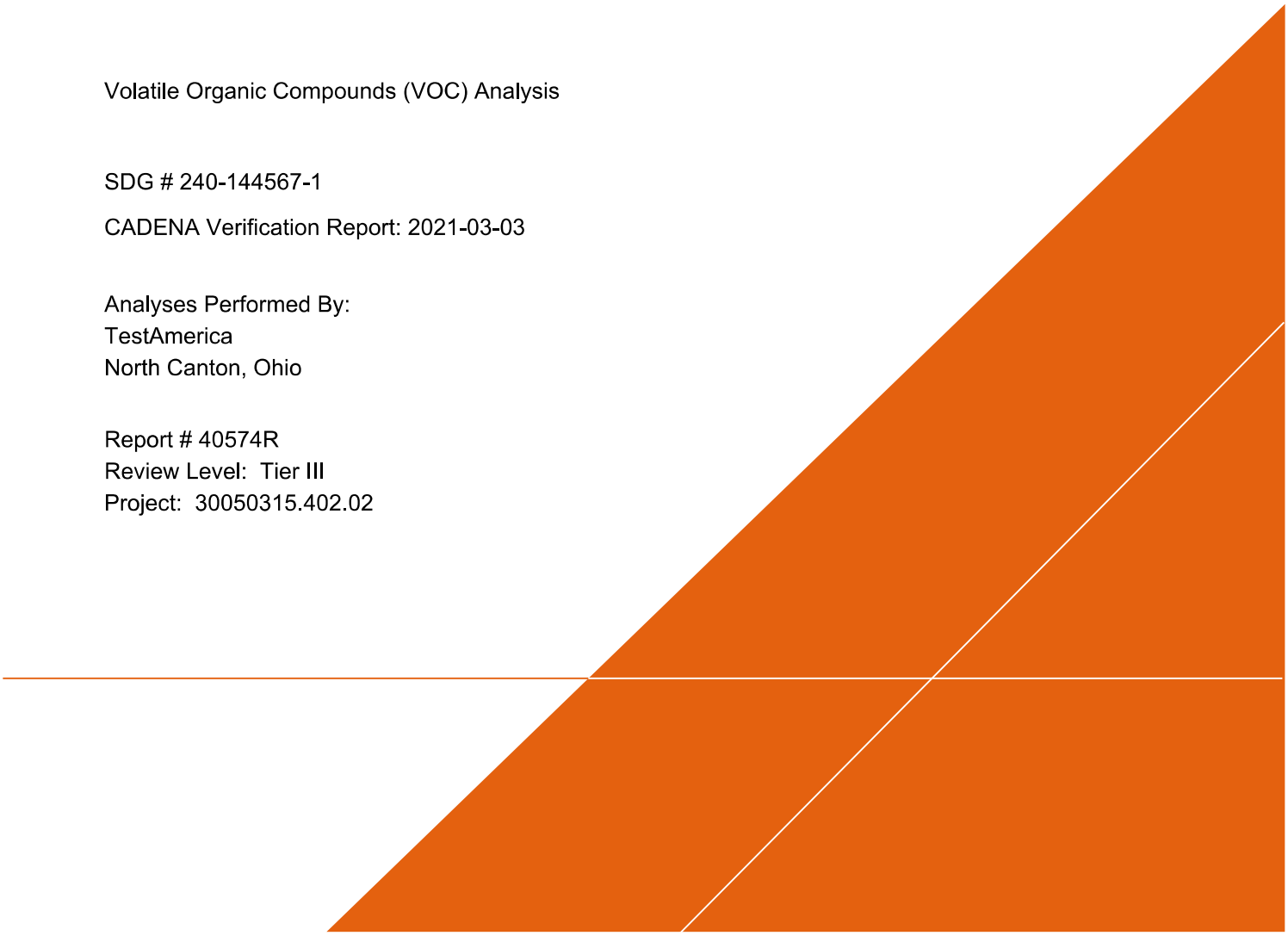
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144567-1

CADENA Verification Report: 2021-03-03

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40574R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144567-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144567-1	Water	02/15/2021		X	
MW-118S_021521	240-144567-3	Water	02/15/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial/Continuing	Lab file ID	Compound	Criteria
TRIP BLANK	CCV %D	UXR3152.D	Tetrachloroethene	+30.7%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action

Initial/Continuing	Criteria	Sample Result	Qualification
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1] RRF of 0.01 only applies to compounds which are typically poor responding compounds (i.e., ketones, 1,4-dioxane, etc.)

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 17, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144815-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/10/2021 9:13:30 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
Review your project results through TotalAccess
Have a Question? Ask The Expert
Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144815-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144815-1

Job ID: 240-144815-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144815-1

Comments
No additional comments.

Receipt
The samples were received on 2/24/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.3º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144815-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144815-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144815-1	TRIP BLANK	Water	02/22/21 00:00	02/24/21 08:00	
240-144815-2	MW-207S_022221	Water	02/22/21 11:55	02/24/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144815-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144815-1

No Detections.

Client Sample ID: MW-207S_022221 — Lab Sample ID: 240-144815-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144815-1

Client Sample ID: TRIP BLANK
Date Collected: 02/22/21 00:00
Date Received: 02/24/21 08:00

Lab Sample ID: 240-144815-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 14:13	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 14:13	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 14:13	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 14:13	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 14:13	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 14:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*		*03/02/21 14:13*	*1*
4-Bromofluorobenzene (Surr)	*77*		*47 - 134*		*03/02/21 14:13*	*1*
Toluene-d8 (Surr)	*87*		*69 - 122*		*03/02/21 14:13*	*1*
Dibromofluoromethane (Surr)	*110*		*78 - 129*		*03/02/21 14:13*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144815-1

Client Sample ID: MW-207S_022221
Date Collected: 02/22/21 11:55
Date Received: 02/24/21 08:00

Lab Sample ID: 240-144815-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 18:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*70 - 133*		*03/01/21 18:03*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 14:45	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 14:45	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 14:45	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 14:45	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 14:45	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 14:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*03/02/21 14:45*	*1*
4-Bromofluorobenzene (Surr)	*75*		*47 - 134*		*03/02/21 14:45*	*1*
Toluene-d8 (Surr)	*87*		*69 - 122*		*03/02/21 14:45*	*1*
Dibromofluoromethane (Surr)	*109*		*78 - 129*		*03/02/21 14:45*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144815-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144718-C-26 MS	Matrix Spike	84	94	92	100
240-144718-C-26 MSD	Matrix Spike Duplicate	84	96	94	101
240-144815-1	TRIP BLANK	97	77	87	110
240-144815-2	MW-207S_022221	100	75	87	109
LCS 240-475003/4	Lab Control Sample	87	95	94	101
MB 240-475003/7	Method Blank	97	82	89	108

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144807-J-4 MS	Matrix Spike	90
240-144807-J-4 MSD	Matrix Spike Duplicate	88
240-144815-2	MW-207S_022221	89
LCS 240-474842/4	Lab Control Sample	90
MB 240-474842/5	Method Blank	86

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475003/7
Matrix: Water
Analysis Batch: 475003

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 11:05	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 11:05	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 11:05	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 11:05	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 11:05	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 11:05	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*		*03/02/21 11:05*	*1*
4-Bromofluorobenzene (Surr)	*82*		*47 - 134*		*03/02/21 11:05*	*1*
Toluene-d8 (Surr)	*89*		*69 - 122*		*03/02/21 11:05*	*1*
Dibromofluoromethane (Surr)	*108*		*78 - 129*		*03/02/21 11:05*	*1*

Lab Sample ID: LCS 240-475003/4
Matrix: Water
Analysis Batch: 475003

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	12.4		ug/L		124	73 - 129
cis-1,2-Dichloroethene	10.0	11.0		ug/L		110	75 - 124
Tetrachloroethene	10.0	10.5		ug/L		105	70 - 125
trans-1,2-Dichloroethene	10.0	10.9		ug/L		109	74 - 130
Trichloroethene	10.0	10.2		ug/L		102	71 - 121
Vinyl chloride	10.0	10.6		ug/L		106	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*94*		*69 - 122*
Dibromofluoromethane (Surr)	*101*		*78 - 129*

Lab Sample ID: 240-144718-C-26 MS
Matrix: Water
Analysis Batch: 475003

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	21		100	132		ug/L		111	64 - 132
cis-1,2-Dichloroethene	56		100	160		ug/L		104	68 - 121
Tetrachloroethene	10	U	100	87.1		ug/L		87	52 - 129
trans-1,2-Dichloroethene	3.9	J	100	102		ug/L		98	69 - 126
Trichloroethene	250		100	319		ug/L		72	56 - 124
Vinyl chloride	3.3	J	100	80.0		ug/L		77	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*
4-Bromofluorobenzene (Surr)	*94*		*47 - 134*
Toluene-d8 (Surr)	*92*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144718-C-26 MS
Matrix: Water
Analysis Batch: 475003

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*100*		*78 - 129*

Lab Sample ID: 240-144718-C-26 MSD
Matrix: Water
Analysis Batch: 475003

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	21		100	139		ug/L		119	64 - 132	6	35
cis-1,2-Dichloroethene	56		100	163		ug/L		107	68 - 121	2	35
Tetrachloroethene	10	U	100	95.7		ug/L		96	52 - 129	9	35
trans-1,2-Dichloroethene	3.9	J	100	108		ug/L		104	69 - 126	6	35
Trichloroethene	250		100	317		ug/L		70	56 - 124	1	35
Vinyl chloride	3.3	J	100	110		ug/L		107	49 - 136	32	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*
Toluene-d8 (Surr)	*94*		*69 - 122*
Dibromofluoromethane (Surr)	*101*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474842/5
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 12:12	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*		*03/01/21 12:12*	*1*

Lab Sample ID: LCS 240-474842/4
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.05		ug/L		91	80 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*70 - 133*

Lab Sample ID: 240-144807-J-4 MS
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	8.95		ug/L		90	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*90*		*70 - 133*

Lab Sample ID: 240-144807-J-4 MSD
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.28		ug/L		93	46 - 170	4	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144815-1

GC/MS VOA

Analysis Batch: 474842

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144815-2	MW-207S_022221	Total/NA	Water	8260B SIM	
MB 240-474842/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474842/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144807-J-4 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144807-J-4 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 475003

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144815-1	TRIP BLANK	Total/NA	Water	8260B	
240-144815-2	MW-207S_022221	Total/NA	Water	8260B	
MB 240-475003/7	Method Blank	Total/NA	Water	8260B	
LCS 240-475003/4	Lab Control Sample	Total/NA	Water	8260B	
240-144718-C-26 MS	Matrix Spike	Total/NA	Water	8260B	
240-144718-C-26 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144815-1

Client Sample ID: TRIP BLANK
Date Collected: 02/22/21 00:00
Date Received: 02/24/21 08:00

Lab Sample ID: 240-144815-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475003	03/02/21 14:13	LEE	TAL CAN

Client Sample ID: MW-207S_022221
Date Collected: 02/22/21 11:55
Date Received: 02/24/21 08:00

Lab Sample ID: 240-144815-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475003	03/02/21 14:45	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	474842	03/01/21 18:03	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144815-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

1-2113

Chain of Custody Record

MICHIGAN TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
190

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No: / of / COCs
Phone: 248-994-2240	Sampler Name: Allyson Hartz	TAT if different from below: 10 day (3 weeks, 2 weeks, 1 week, 2 days, 1 day)	For lab use only: Walk-in client; Lab sampling; Job/SDG No:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 trip blank
MW-2075_022321	2/22/21	11:55		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-144815 Chain of Custody

Possible Hazard Identification: Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / Disposal By Lab / Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company:	Date/Time:		Company:	Date/Time:
Relinquished by: AHartz	Arcadis	2/22/21 17:00	Received by: Novi cold storage	Arcadis	2/22/21 17 00
Relinquished by: Julia McClafferty	Arcadis	2/23/2021	Received by: Amanda Battershell	ETA	2/23/21 10.04
Relinquished by: Amanda Battershell	ETA	2/23/21 10.47	Received in Laboratory by:		2-24-21 800

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3/10/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 141815
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by:

Cooler Received on 2-24-21 Opened on 2-24-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1-2 °C Corrected Cooler Temp. 1-3 °C

IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?	(Y)	N
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	(No)

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

_____

_____

_____

_____

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

March 10, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144815-1
Sample date: 2021-02-22
Report received by CADENA: 2021-03-10
Initial Data Verification completed by CADENA: 2021-03-10
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144815-1

		Sample Name:	TRIP BLANK				MW-207S_022221			
		Lab Sample ID:	2401448151				2401448152			
		Sample Date:	2/22/2021				2/22/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

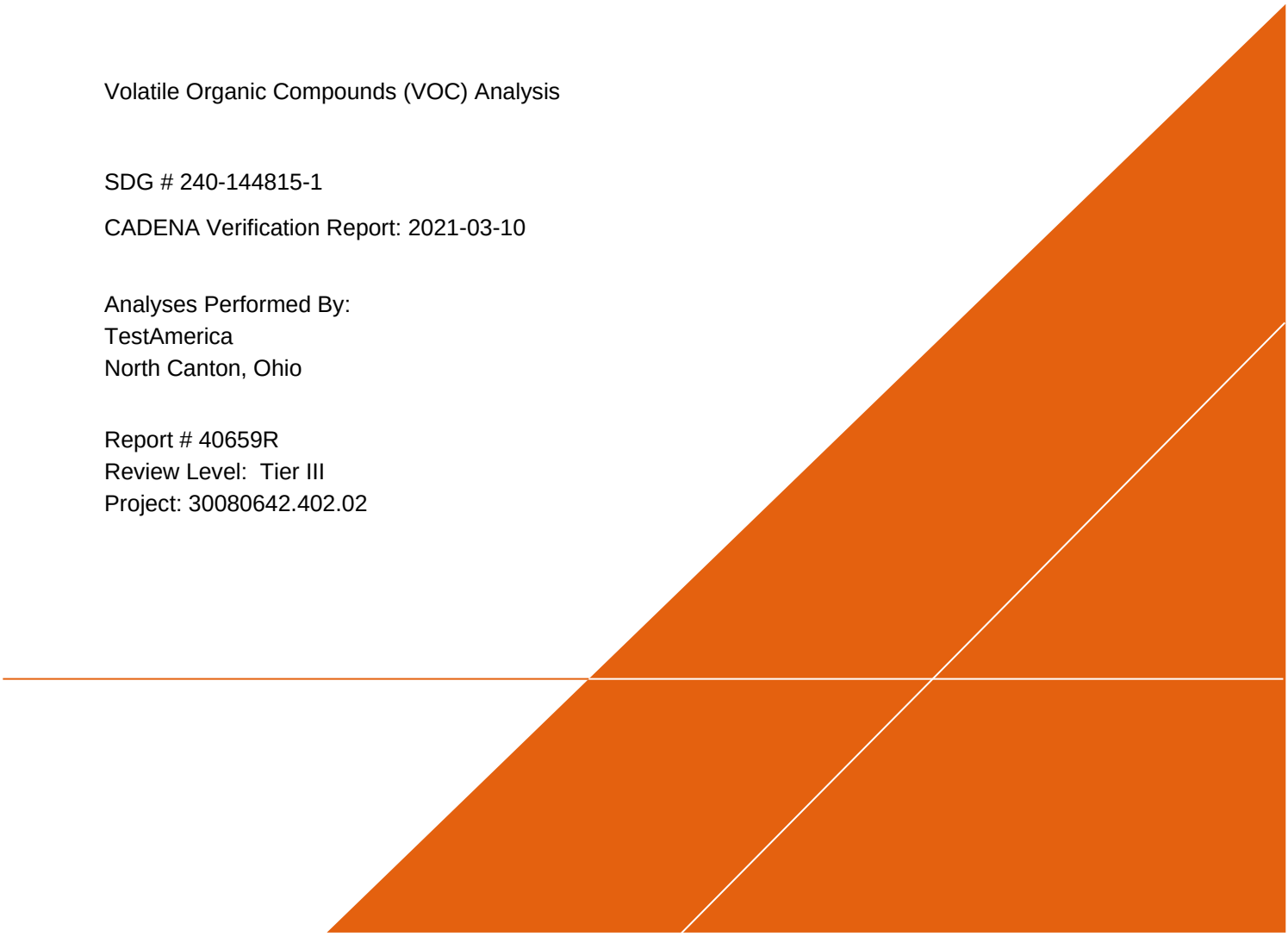
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144815-1

CADENA Verification Report: 2021-03-10

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40659R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144815-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144815-1	Water	02/22/2021		X	
MW-207S_022221	240-144815-2	Water	02/22/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

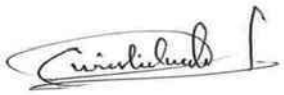
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 22, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 24, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

1-21-3

Chain of Custody Record

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190 TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	/ of / COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Allyson Hartz	TAT if different from below: 10 day; 3 weeks / 2 weeks / 1 week / 2 days / 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 trip blank
MW-2075_022321	2/22/21	11:55		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-144815 Chain of Custody

Possible Hazard Identification
✓ Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Return to Client ✓ Disposal By Lab Archive For Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
AHartz	Arcadis	2/22/21 17:00	Novi cold storage	Arcadis	2/22/21 17 00
Julia McClafferty	Arcadis	2/23/2021	Amanda Battershell	ETA	2/23/21 10:04
Amanda Battershell	ETA	2/23/21 10:47	Received in Laboratory by:	Company:	Date/Time: 2-24-21 800

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144815-1

Date Collected: 02/22/21 00:00
Matrix: Water
Date Received: 02/24/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 14:13	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 14:13	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 14:13	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 14:13	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 14:13	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 14:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*		*03/02/21 14:13*	*1*
4-Bromofluorobenzene (Surr)	*77*		*47 - 134*		*03/02/21 14:13*	*1*
Toluene-d8 (Surr)	*87*		*69 - 122*		*03/02/21 14:13*	*1*
Dibromofluoromethane (Surr)	*110*		*78 - 129*		*03/02/21 14:13*	*1*

Client Sample ID: MW-207S_022221
Lab Sample ID: 240-144815-2

Date Collected: 02/22/21 11:55
Matrix: Water
Date Received: 02/24/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 18:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*70 - 133*		*03/01/21 18:03*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 14:45	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 14:45	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 14:45	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 14:45	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 14:45	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 14:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*03/02/21 14:45*	*1*
4-Bromofluorobenzene (Surr)	*75*		*47 - 134*		*03/02/21 14:45*	*1*
Toluene-d8 (Surr)	*87*		*69 - 122*		*03/02/21 14:45*	*1*
Dibromofluoromethane (Surr)	*109*		*78 - 129*		*03/02/21 14:45*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144569-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
2/28/2021 1:59:52 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144569-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144569-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144569-1

Comments
No additional comments.

Receipt
The samples were received on 2/17/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.1° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144569-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144569-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144569-1	TRIP BLANK	Water	02/12/21 00:00	02/17/21 08:00	
240-144569-2	MW-95S_021221	Water	02/12/21 13:10	02/17/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144569-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144569-1

No Detections.

Client Sample ID: MW-95S_021221 — Lab Sample ID: 240-144569-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	0.17	J	1.0	0.16	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144569-1

Client Sample ID: TRIP BLANK

Date Collected: 02/12/21 00:00
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144569-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 13:02	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/23/21 13:02	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 13:02	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 13:02	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/23/21 13:02	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/23/21 13:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*75 - 130*		*02/23/21 13:02*	*1*
4-Bromofluorobenzene (Surr)	*94*		*47 - 134*		*02/23/21 13:02*	*1*
Toluene-d8 (Surr)	*104*		*69 - 122*		*02/23/21 13:02*	*1*
Dibromofluoromethane (Surr)	*101*		*78 - 129*		*02/23/21 13:02*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144569-1

Client Sample ID: MW-95S_021221

Date Collected: 02/12/21 13:10
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144569-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 17:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/22/21 17:26*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 13:24	1
cis-1,2-Dichloroethene	**0.17**	**J**	1.0	0.16	ug/L			02/23/21 13:24	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 13:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 13:24	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/23/21 13:24	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/23/21 13:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*75 - 130*		*02/23/21 13:24*	*1*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*		*02/23/21 13:24*	*1*
Toluene-d8 (Surr)	*96*		*69 - 122*		*02/23/21 13:24*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*02/23/21 13:24*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144569-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144569-1	TRIP BLANK	103	94	104	101
240-144569-2	MW-95S_021221	102	87	96	99
240-144576-D-2 MS	Matrix Spike	97	96	103	97
240-144576-E-2 MSD	Matrix Spike Duplicate	95	93	98	97
LCS 240-474092/4	Lab Control Sample	101	103	105	109
MB 240-474092/6	Method Blank	98	87	101	98

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144518-M-2 MS	Matrix Spike	84
240-144518-M-2 MSD	Matrix Spike Duplicate	84
240-144569-2	MW-95S_021221	83
LCS 240-473970/4	Lab Control Sample	80
MB 240-473970/5	Method Blank	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474092/6
Matrix: Water
Analysis Batch: 474092

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 11:10	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/23/21 11:10	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 11:10	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 11:10	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/23/21 11:10	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/23/21 11:10	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 130*		*02/23/21 11:10*	*1*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*		*02/23/21 11:10*	*1*
Toluene-d8 (Surr)	*101*		*69 - 122*		*02/23/21 11:10*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*02/23/21 11:10*	*1*

Lab Sample ID: LCS 240-474092/4
Matrix: Water
Analysis Batch: 474092

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.9		ug/L		109	73 - 129
cis-1,2-Dichloroethene	10.0	10.8		ug/L		108	75 - 124
Tetrachloroethene	10.0	11.7		ug/L		117	70 - 125
trans-1,2-Dichloroethene	10.0	10.6		ug/L		106	74 - 130
Trichloroethene	10.0	10.4		ug/L		104	71 - 121
Vinyl chloride	10.0	11.4		ug/L		114	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*
Toluene-d8 (Surr)	*105*		*69 - 122*
Dibromofluoromethane (Surr)	*109*		*78 - 129*

Lab Sample ID: 240-144576-D-2 MS
Matrix: Water
Analysis Batch: 474092

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.00		ug/L		90	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	9.45		ug/L		95	68 - 121
Tetrachloroethene	1.0	U	10.0	8.55		ug/L		85	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.17		ug/L		92	69 - 126
Trichloroethene	1.0	U	10.0	9.03		ug/L		90	56 - 124
Vinyl chloride	1.0	U	10.0	9.58		ug/L		96	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*
Toluene-d8 (Surr)	*103*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144576-D-2 MS
Matrix: Water
Analysis Batch: 474092

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*97*		*78 - 129*

Lab Sample ID: 240-144576-E-2 MSD
Matrix: Water
Analysis Batch: 474092

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.58		ug/L		96	64 - 132	6	35
cis-1,2-Dichloroethene	1.0	U	10.0	9.91		ug/L		99	68 - 121	5	35
Tetrachloroethene	1.0	U	10.0	10.1		ug/L		101	52 - 129	17	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.82		ug/L		98	69 - 126	7	35
Trichloroethene	1.0	U	10.0	10.2		ug/L		102	56 - 124	12	35
Vinyl chloride	1.0	U	10.0	10.5		ug/L		105	49 - 136	9	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*95*		*75 - 130*
4-Bromofluorobenzene (Surr)	*93*		*47 - 134*
Toluene-d8 (Surr)	*98*		*69 - 122*
Dibromofluoromethane (Surr)	*97*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473970/5
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 14:03	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/22/21 14:03*	*1*

Lab Sample ID: LCS 240-473970/4
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.3		ug/L		103	80 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*

Lab Sample ID: 240-144518-M-2 MS
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	10.3		ug/L		103	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*

Lab Sample ID: 240-144518-M-2 MSD
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.4		ug/L		104	46 - 170	1	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*

GC/MS VOA

Analysis Batch: 473970

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144569-2	MW-95S_021221	Total/NA	Water	8260B SIM	
MB 240-473970/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-473970/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144518-M-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144518-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474092

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144569-1	TRIP BLANK	Total/NA	Water	8260B	
240-144569-2	MW-95S_021221	Total/NA	Water	8260B	
MB 240-474092/6	Method Blank	Total/NA	Water	8260B	
LCS 240-474092/4	Lab Control Sample	Total/NA	Water	8260B	
240-144576-D-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144576-E-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144569-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144569-1

Date Collected: 02/12/21 00:00

Matrix: Water

Date Received: 02/17/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474092	02/23/21 13:02	LEE	TAL CAN

Client Sample ID: MW-95S_021221

Lab Sample ID: 240-144569-2

Date Collected: 02/12/21 13:10

Matrix: Water

Date Received: 02/17/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474092	02/23/21 13:24	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	473970	02/22/21 17:26	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144569-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

MICHIGAN 190 TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No: (of) COCs
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day	For lab use only: Walk-in client; Lab sampling; Job/SDG No:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-95S_021221	2/12/21	1310		6						6					N	G	X	X	X	X	X	X	X	3 vocs for 8260B 3 vocs for 8260B SIM

240-144569 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com, Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: Witherspoon	Arcadis	2/12/21 1700	Received by: Novi cold storage	Arcadis	2/12/21 1700
Relinquished by:	ARCADIS	2/15/21 1010	Received by:	ETA	2/15/21 1010
Relinquished by: Amanda Battenhall	ETA	2/15/21 10.57	Received in Laboratory by:	Company:	Date/Time:

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COLD STORAGE ETA 2/15/21 10.57

Amanda Battenhall ETA 2/16/21 907 ETA 2-17-21 800

2/28/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 144569**
Canton Facility

Client Arcadis Site Name

Cooler Received on 2-17-21 Opened on 2-17-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Cooler unpacked by: MattSnyder

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: ~~Bubble Wrap~~ Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form

IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 0.0 °C Corrected Cooler Temp. 0.1 °C

IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity ____	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	(Yes)	No
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ____	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.

Sample(s) ____ were received in a broken container.

Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.

Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

February 28, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144569-1
Sample date: 2021-02-12
Report received by CADENA: 2021-02-28
Initial Data Verification completed by CADENA: 2021-02-28
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144569-1

		Sample Name:	TRIP BLANK				MW-95S_021221			
		Lab Sample ID:	2401445691				2401445692			
		Sample Date:	2/12/2021				2/12/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	0.17	1.0	ug/l	J
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

SHALLOW LOW-FLOW GROUNDWATER SAMPLING FORM

Project No.	30050315.402.01	Well ID	MW-95S			Date	2-12-21
Project Name/Location		Ford LTP		Weather	17.6 degrees F and . The wind is blowing N/NE at 9.2 mph.		
Measuring Pt. Description	Top of Casing	Screen Setting (ft-bmp)	2.5-12.5	Casing Diameter (in.)	2	Well Material	PVC
Static Water Level (ft-bmp)	4.88	Total Depth (ft-bmp)	12.00	Water Column (ft.)	7.12	Gallons in Well	1.16
		Pump Intake (ft-bmp)	6.38	Purge Method	Low-Flow	Sample Method	Grab
		Well Volumes Purged	1.34				
Sample Time: Label	13:10	Volume Purged	1.56 gallons	Replicate/Code No.	--	Sampled by	Emma Witherspoon
Purge Start	12:07						
Purge End	13:14						

Time	Minutes Elapsed between Readings	Flow Rate (mL/min) [100-300 mL/min]	Depth to Water (ft) [± 0.3]	Total Gallons Purged	pH [± 0.1]	Cond. (mS/cm) [± 3%]	Turbidity (NTU) [± 10%*]	DO (mg/L) [± 10%]	Temp. (°C) [± 3%]	Redox (mV) [± 10mV]	Appearance	
											Color	Odor
12:10	0	100	4.90	0.00	7.41	1.19	0.02	3.97	5.8	-90.4	Clear	No Odor
12:15	5	100	4.90	0.13	6.75	1.18	0.94	3.43	6.1	92.7	Clear	No Odor
12:20	5	100	4.90	0.26	6.69	1.17	0.02	3.25	6.2	96.2	Clear	No Odor
12:25	5	100	4.90	0.39	6.69	1.29	0.02	3.05	6.4	100.4	Clear	No Odor
12:30	5	100	4.90	0.52	6.73	1.59	0.02	2.06	6.7	80.1	Clear	No Odor
12:35	5	100	4.90	0.65	6.78	1.83	0.02	1.46	6.8	43.5	Clear	No Odor
12:40	5	100	4.90	0.78	6.79	1.93	0.02	1.34	6.9	27.6	Clear	No Odor
12:45	5	100	4.90	0.91	6.79	2.05	0.02	1.18	6.9	14.7	Clear	No Odor
12:50	5	100	4.90	1.04	6.79	2.18	0.02	1.12	7.0	2.8	Clear	No Odor
12:55	5	100	4.90	1.17	6.80	2.25	0.02	1.01	7.1	-5.2	Clear	No Odor
13:00	5	100	4.90	1.30	6.81	2.32	0.02	0.90	7.1	-12.6	Clear	No Odor
13:05	5	100	4.90	1.43	6.81	2.34	0.79	0.83	7.1	-14.4	Clear	No Odor
13:10	5	100	4.90	1.56	6.81	2.40	0.36	1.11	7.1	-16.9	Clear	No Odor
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* **Turbidity** < 50 NTU and ±10% or within 1 NTU of a previous reading when <10 NTU

Constituents Sampled	Container	Number	Preservative
1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, PCE, TCE, VC	40 mL Glass	3	HCL
1,4-dioxane	40 mL Glass	3	HCL

Comments

None

Well Casing Volumes

Gallons/Foot					
	1" = 0.04	1.5" = 0.09	2.5" = 0.26	3.5" = 0.50	6" = 1.47
	1.25" = 0.06	2" = 0.16	3" = 0.37	4" = 0.65	

Well Information

Well Location:	12131 Boston Post; back yard	Well Locked at Arrival:	yes
Condition of Well:	Good	Well Locked at Departure:	yes
Well Completion:	Flush mount	Lock Functioning:	yes

ARCADIS

SHALLOW LOW-FLOW GROUNDWATER SAMPLING FORM

Project No.: 30050315.402.01 Page 1 of 1

Site Location: Ford LTP 12131 Boston Post; back yard

Prepared By: Emma Witherspoon

Date	Time	Description of Activities
2/12/2021	23:40	Arrive onsite
2/12/2021	12:01	Record static depth to water
2/12/2021	12:07	Begin purging well
2/12/2021	13:10	Collect sample MW-95S_021221
2/12/2021	13:14	End purge and turn off pump, begin decon of equipment
2/12/2021	13:30	Offsite
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ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

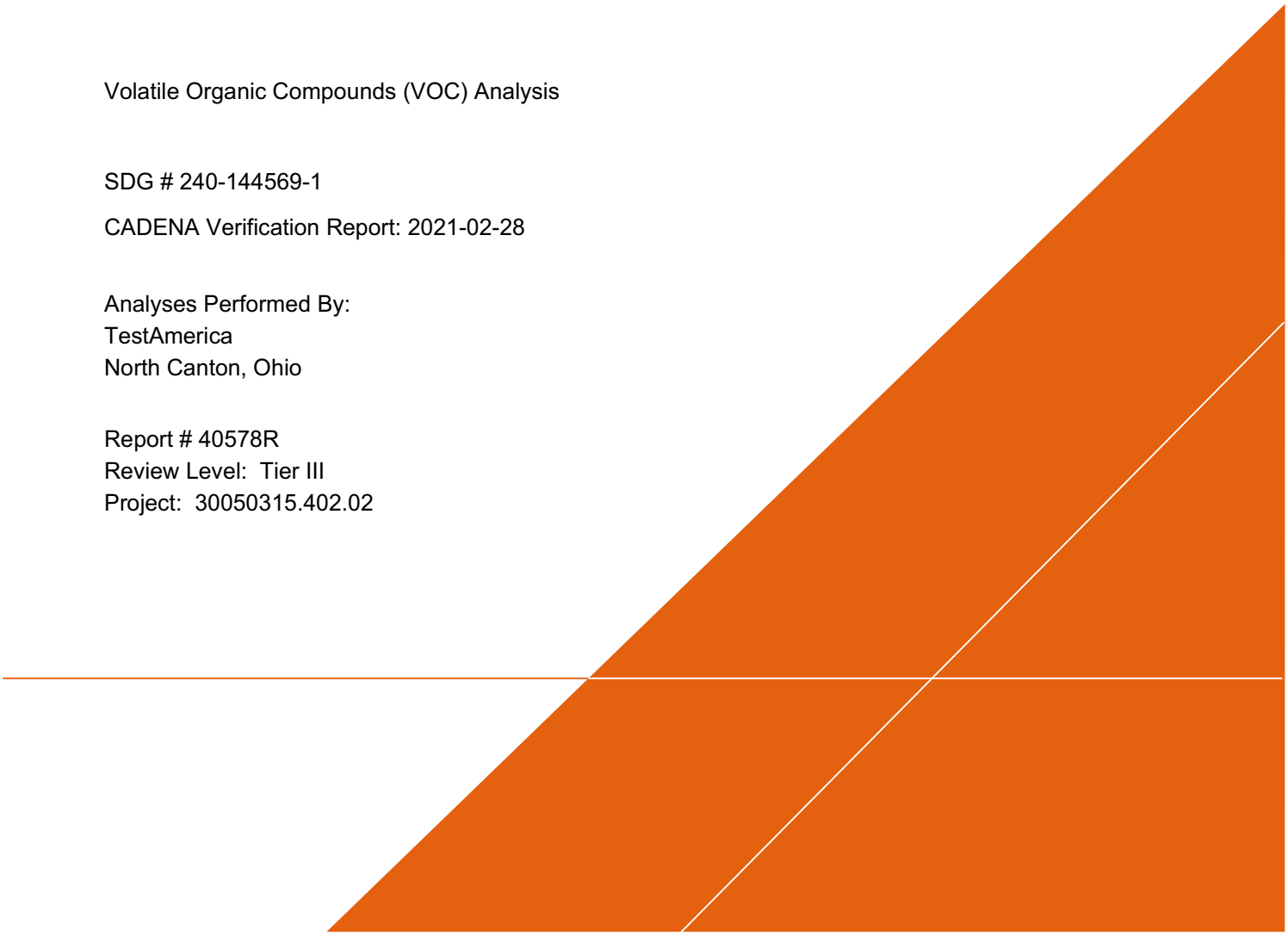
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144569-1

CADENA Verification Report: 2021-02-28

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40578R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144569-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144569-1	Water	02/12/2021		X	
MW-95S_021221	240-144569-2	Water	02/12/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 17, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 18, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144574-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
2/28/2021 2:05:41 PM

Michael DelMonico, Project Manager I
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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144574-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144574-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144574-1

Comments
No additional comments.

Receipt
The samples were received on 2/17/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.9° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144574-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144574-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144574-1	TRIP BLANK	Water	02/12/21 00:00	02/17/21 08:00	
240-144574-2	MW-160S_021221	Water	02/12/21 11:10	02/17/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144574-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144574-1

No Detections.

Client Sample ID: MW-160S_021221 — Lab Sample ID: 240-144574-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144574-1

Client Sample ID: TRIP BLANK
Date Collected: 02/12/21 00:00
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144574-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 15:59	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/23/21 15:59	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 15:59	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 15:59	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/23/21 15:59	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/23/21 15:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 130*		*02/23/21 15:59*	*1*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*		*02/23/21 15:59*	*1*
Toluene-d8 (Surr)	*99*		*69 - 122*		*02/23/21 15:59*	*1*
Dibromofluoromethane (Surr)	*97*		*78 - 129*		*02/23/21 15:59*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144574-1

Client Sample ID: MW-160S_021221

Date Collected: 02/12/21 11:10
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144574-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 19:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/22/21 19:07*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 16:21	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/23/21 16:21	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 16:21	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 16:21	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/23/21 16:21	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/23/21 16:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*75 - 130*		*02/23/21 16:21*	*1*
4-Bromofluorobenzene (Surr)	*84*		*47 - 134*		*02/23/21 16:21*	*1*
Toluene-d8 (Surr)	*97*		*69 - 122*		*02/23/21 16:21*	*1*
Dibromofluoromethane (Surr)	*96*		*78 - 129*		*02/23/21 16:21*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144574-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144574-1	TRIP BLANK	98	89	99	97
240-144574-2	MW-160S_021221	96	84	97	96
240-144576-D-2 MS	Matrix Spike	97	96	103	97
240-144576-E-2 MSD	Matrix Spike Duplicate	95	93	98	97
LCS 240-474092/4	Lab Control Sample	101	103	105	109
MB 240-474092/6	Method Blank	98	87	101	98

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144574-2	MW-160S_021221	82
240-144576-G-2 MS	Matrix Spike	81
240-144576-G-2 MSD	Matrix Spike Duplicate	81
LCS 240-473970/4	Lab Control Sample	80
MB 240-473970/5	Method Blank	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474092/6
Matrix: Water
Analysis Batch: 474092

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 11:10	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/23/21 11:10	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 11:10	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 11:10	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/23/21 11:10	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/23/21 11:10	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 130*		*02/23/21 11:10*	*1*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*		*02/23/21 11:10*	*1*
Toluene-d8 (Surr)	*101*		*69 - 122*		*02/23/21 11:10*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*02/23/21 11:10*	*1*

Lab Sample ID: LCS 240-474092/4
Matrix: Water
Analysis Batch: 474092

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.9		ug/L		109	73 - 129
cis-1,2-Dichloroethene	10.0	10.8		ug/L		108	75 - 124
Tetrachloroethene	10.0	11.7		ug/L		117	70 - 125
trans-1,2-Dichloroethene	10.0	10.6		ug/L		106	74 - 130
Trichloroethene	10.0	10.4		ug/L		104	71 - 121
Vinyl chloride	10.0	11.4		ug/L		114	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*
Toluene-d8 (Surr)	*105*		*69 - 122*
Dibromofluoromethane (Surr)	*109*		*78 - 129*

Lab Sample ID: 240-144576-D-2 MS
Matrix: Water
Analysis Batch: 474092

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.00		ug/L		90	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	9.45		ug/L		95	68 - 121
Tetrachloroethene	1.0	U	10.0	8.55		ug/L		85	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.17		ug/L		92	69 - 126
Trichloroethene	1.0	U	10.0	9.03		ug/L		90	56 - 124
Vinyl chloride	1.0	U	10.0	9.58		ug/L		96	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*
Toluene-d8 (Surr)	*103*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144576-D-2 MS
Matrix: Water
Analysis Batch: 474092

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*97*		*78 - 129*

Lab Sample ID: 240-144576-E-2 MSD
Matrix: Water
Analysis Batch: 474092

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.58		ug/L		96	64 - 132	6	35
cis-1,2-Dichloroethene	1.0	U	10.0	9.91		ug/L		99	68 - 121	5	35
Tetrachloroethene	1.0	U	10.0	10.1		ug/L		101	52 - 129	17	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.82		ug/L		98	69 - 126	7	35
Trichloroethene	1.0	U	10.0	10.2		ug/L		102	56 - 124	12	35
Vinyl chloride	1.0	U	10.0	10.5		ug/L		105	49 - 136	9	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*95*		*75 - 130*
4-Bromofluorobenzene (Surr)	*93*		*47 - 134*
Toluene-d8 (Surr)	*98*		*69 - 122*
Dibromofluoromethane (Surr)	*97*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473970/5
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 14:03	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/22/21 14:03*	*1*

Lab Sample ID: LCS 240-473970/4
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.3		ug/L		103	80 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*

Lab Sample ID: 240-144576-G-2 MS
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	10.7		ug/L		107	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

Lab Sample ID: 240-144576-G-2 MSD
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	11.1		ug/L		111	46 - 170	4	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

GC/MS VOA

Analysis Batch: 473970

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144574-2	MW-160S_021221	Total/NA	Water	8260B SIM	
MB 240-473970/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-473970/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144576-G-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144576-G-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474092

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144574-1	TRIP BLANK	Total/NA	Water	8260B	
240-144574-2	MW-160S_021221	Total/NA	Water	8260B	
MB 240-474092/6	Method Blank	Total/NA	Water	8260B	
LCS 240-474092/4	Lab Control Sample	Total/NA	Water	8260B	
240-144576-D-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144576-E-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144574-1

Client Sample ID: TRIP BLANK
Date Collected: 02/12/21 00:00
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144574-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474092	02/23/21 15:59	LEE	TAL CAN

Client Sample ID: MW-160S_021221
Date Collected: 02/12/21 11:10
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144574-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474092	02/23/21 16:21	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	473970	02/22/21 19:07	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144574-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

MICHIGAN 190 TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI. 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:	10 day ✓ 2 weeks 3 weeks 1 week 2 days 1 day		Lab sampling
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-160S_021221	2/12/21	1110		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-144574 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client ✓ Disposal By Lab Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company:	Date/Time:		Company:	Date/Time:
Relinquished by: Emma Witherspoon	Arcadis	2/12/21 1700	Received by: Novi Cold Storage	Arcadis	2/12/21 1700
Relinquished by: Christopher Allen	ARCADIS	2/15/21 1010	Received by: Amanda Battenfield	ETA	2/15/21 1010
Relinquished by: Amanda Battenfield	ETA	2/15/21 10:57	Received in Laboratory by:	Company:	Date/Time:

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COLD STORAGE ETA 2/15/21 10:57

Amanda Battenfield ETA 2/16/21 907 [redacted] ETA 2-17-21 800

2/28/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 445574**
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: MathSnyder

Cooler Received on 2-17-21 Opened on 2-17-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: ~~Bubble Wrap~~ Foam Plastic Bag None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form

IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 0.8 °C Corrected Cooler Temp 0.9 °C

IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity _____	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	(Yes)	No
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

_____

_____

_____

_____

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

February 28, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144574-1
Sample date: 2021-02-12
Report received by CADENA: 2021-02-28
Initial Data Verification completed by CADENA: 2021-02-28
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144574-1

		Sample Name:	TRIP BLANK				MW-160S_021221			
		Lab Sample ID:	2401445741				2401445742			
		Sample Date:	2/12/2021				2/12/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

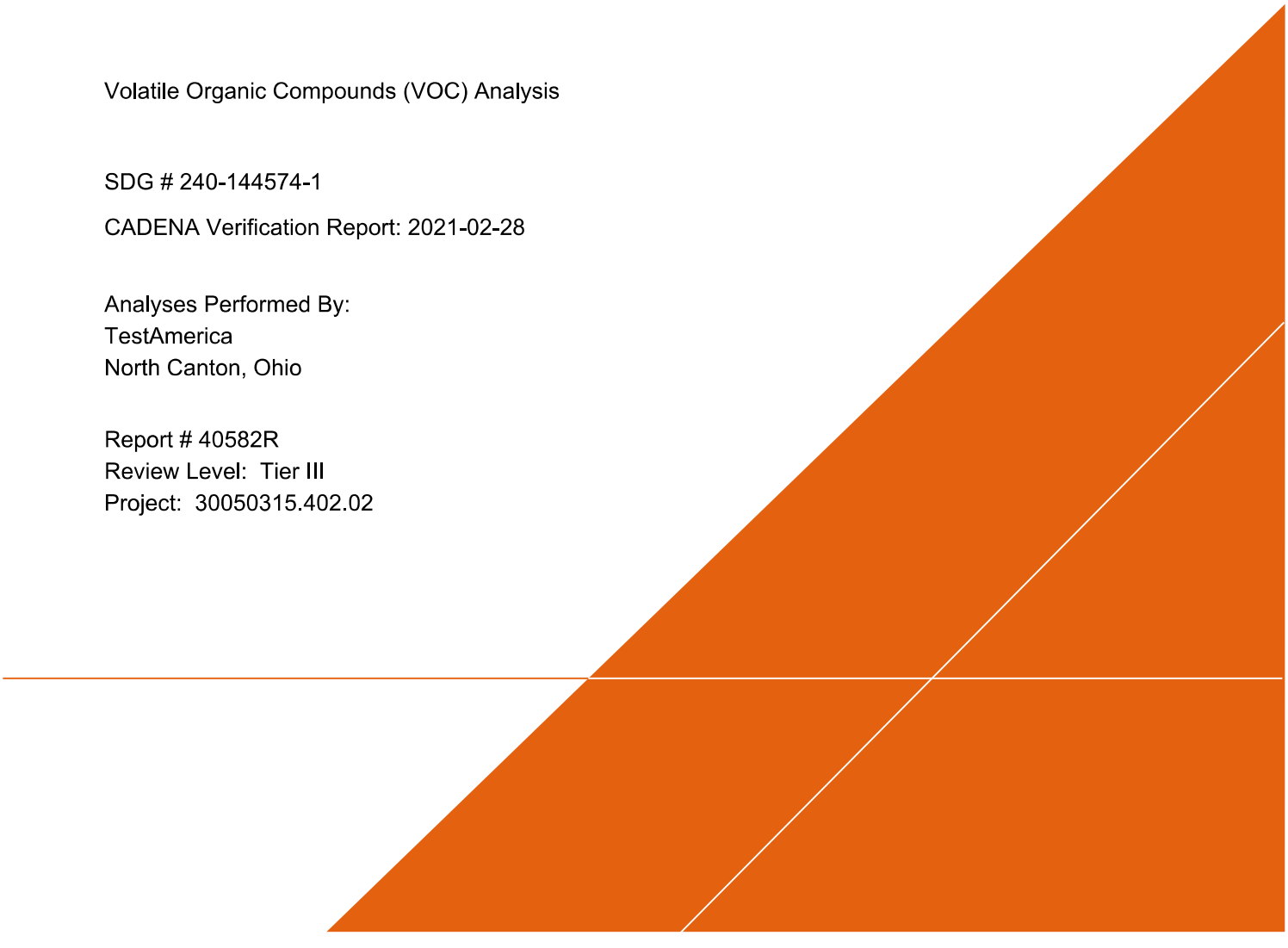
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144574-1

CADENA Verification Report: 2021-02-28

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40582R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144574-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144574-1	Water	02/12/2021		X	
MW-160S_021221	240-144574-2	Water	02/12/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 17, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 18, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica MICHIGAN 190

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other			COC No:
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
City/State/Zip: Novi, MI. 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-160S_021221	2/12/21	1110		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3VOAs for 8260BSIM

240-144574 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
E Witherspoon	Arcadis	2/12/21 1700	Novi Cold Storage	Arcadis	2/12/21 1700
Crayton Allen	ARCADIS	2/15/21 1010	Amanda Battenfield	ETA	2/15/21 1010
Amanda Battenfield	ETA	2/15/21 10:57	Received in Laboratory by:	Company:	Date/Time:

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COLD STORAGE ETA 2/15/21 10:57

Amanda Battenfield ETA 2/16/21 907 [illegible] ETA 2-17-21 800

02/28/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144574-1
Date Collected: 02/12/21 00:00
Matrix: Water
Date Received: 02/17/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 15:59	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/23/21 15:59	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 15:59	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 15:59	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/23/21 15:59	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/23/21 15:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 130*		*02/23/21 15:59*	*1*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*		*02/23/21 15:59*	*1*
Toluene-d8 (Surr)	*99*		*69 - 122*		*02/23/21 15:59*	*1*
Dibromofluoromethane (Surr)	*97*		*78 - 129*		*02/23/21 15:59*	*1*

Client Sample ID: MW-160S_021221
Lab Sample ID: 240-144574-2
Date Collected: 02/12/21 11:10
Matrix: Water
Date Received: 02/17/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 19:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/22/21 19:07*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 16:21	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/23/21 16:21	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 16:21	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 16:21	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/23/21 16:21	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/23/21 16:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*75 - 130*		*02/23/21 16:21*	*1*
4-Bromofluorobenzene (Surr)	*84*		*47 - 134*		*02/23/21 16:21*	*1*
Toluene-d8 (Surr)	*97*		*69 - 122*		*02/23/21 16:21*	*1*
Dibromofluoromethane (Surr)	*96*		*78 - 129*		*02/23/21 16:21*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-145138-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/12/2021 4:46:05 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
Review your project results through TotalAccess
Have a Question? Ask The Expert
Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145138-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145138-1

Job ID: 240-145138-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-145138-1

Comments
No additional comments.

Receipt
The samples were received on 2/27/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.9º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145138-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145138-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-145138-1	TRIP BLANK	Water	02/25/21 00:00	02/27/21 08:00	
240-145138-2	MW-166S_022521	Water	02/25/21 13:47	02/27/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145138-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-145138-1

No Detections.

Client Sample ID: MW-166S_022521 — Lab Sample ID: 240-145138-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145138-1

Client Sample ID: TRIP BLANK
Date Collected: 02/25/21 00:00
Date Received: 02/27/21 08:00

Lab Sample ID: 240-145138-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 17:01	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 17:01	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 17:01	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 17:01	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 17:01	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 17:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*75 - 130*		*03/03/21 17:01*	*1*
4-Bromofluorobenzene (Surr)	*77*		*47 - 134*		*03/03/21 17:01*	*1*
Toluene-d8 (Surr)	*87*		*69 - 122*		*03/03/21 17:01*	*1*
Dibromofluoromethane (Surr)	*115*		*78 - 129*		*03/03/21 17:01*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145138-1

Client Sample ID: MW-166S_022521
Date Collected: 02/25/21 13:47
Date Received: 02/27/21 08:00

Lab Sample ID: 240-145138-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/04/21 14:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*70 - 133*		*03/04/21 14:46*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 17:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 17:22	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 17:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 17:22	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 17:22	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 17:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*03/03/21 17:22*	*1*
4-Bromofluorobenzene (Surr)	*77*		*47 - 134*		*03/03/21 17:22*	*1*
Toluene-d8 (Surr)	*85*		*69 - 122*		*03/03/21 17:22*	*1*
Dibromofluoromethane (Surr)	*117*		*78 - 129*		*03/03/21 17:22*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145138-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144838-B-2 MS	Matrix Spike	89	98	95	107
240-144838-B-2 MSD	Matrix Spike Duplicate	85	96	93	101
240-145138-1	TRIP BLANK	102	77	87	115
240-145138-2	MW-166S_022521	100	77	85	117
LCS 240-475239/4	Lab Control Sample	87	95	93	103
MB 240-475239/7	Method Blank	92	79	88	103

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-145136-J-2 MS	Matrix Spike	85
240-145136-J-2 MSD	Matrix Spike Duplicate	86
240-145138-2	MW-166S_022521	87
LCS 240-475458/4	Lab Control Sample	84
MB 240-475458/5	Method Blank	87

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475239/7
Matrix: Water
Analysis Batch: 475239

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 11:11	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 11:11	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 11:11	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 11:11	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 11:11	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 11:11	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*		*03/03/21 11:11*	*1*
4-Bromofluorobenzene (Surr)	*79*		*47 - 134*		*03/03/21 11:11*	*1*
Toluene-d8 (Surr)	*88*		*69 - 122*		*03/03/21 11:11*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*03/03/21 11:11*	*1*

Lab Sample ID: LCS 240-475239/4
Matrix: Water
Analysis Batch: 475239

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	12.8		ug/L		128	73 - 129
cis-1,2-Dichloroethene	10.0	11.1		ug/L		111	75 - 124
Tetrachloroethene	10.0	10.5		ug/L		105	70 - 125
trans-1,2-Dichloroethene	10.0	11.0		ug/L		110	74 - 130
Trichloroethene	10.0	10.2		ug/L		102	71 - 121
Vinyl chloride	10.0	11.0		ug/L		110	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*103*		*78 - 129*

Lab Sample ID: 240-144838-B-2 MS
Matrix: Water
Analysis Batch: 475239

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*75 - 130*
4-Bromofluorobenzene (Surr)	*98*		*47 - 134*
Toluene-d8 (Surr)	*95*		*69 - 122*
Dibromofluoromethane (Surr)	*107*		*78 - 129*

Lab Sample ID: 240-144838-B-2 MSD
Matrix: Water
Analysis Batch: 475239

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*75 - 130*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144838-B-2 MSD
Matrix: Water
Analysis Batch: 475239

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*101*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475458/5
Matrix: Water
Analysis Batch: 475458

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/04/21 11:50	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*87*		*70 - 133*		*03/04/21 11:50*	*1*

Lab Sample ID: LCS 240-475458/4
Matrix: Water
Analysis Batch: 475458

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	8.91		ug/L		89	80 - 135		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*

Lab Sample ID: 240-145136-J-2 MS
Matrix: Water
Analysis Batch: 475458

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	4.1		10.0	13.2		ug/L		91	46 - 170		

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*85*		*70 - 133*

Lab Sample ID: 240-145136-J-2 MSD
Matrix: Water
Analysis Batch: 475458

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	4.1		10.0	14.1		ug/L		100	46 - 170	6	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145138-1

GC/MS VOA

Analysis Batch: 475239

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-145138-1	TRIP BLANK	Total/NA	Water	8260B	
240-145138-2	MW-166S_022521	Total/NA	Water	8260B	
MB 240-475239/7	Method Blank	Total/NA	Water	8260B	
LCS 240-475239/4	Lab Control Sample	Total/NA	Water	8260B	
240-144838-B-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144838-B-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 475458

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-145138-2	MW-166S_022521	Total/NA	Water	8260B SIM	
MB 240-475458/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-475458/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-145136-J-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-145136-J-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145138-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-145138-1

Date Collected: 02/25/21 00:00

Matrix: Water

Date Received: 02/27/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475239	03/03/21 17:01	LEE	TAL CAN

Client Sample ID: MW-166S_022521

Lab Sample ID: 240-145138-2

Date Collected: 02/25/21 13:47

Matrix: Water

Date Received: 02/27/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475239	03/03/21 17:22	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	475458	03/04/21 14:46	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145138-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name:	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day (10 day)		Walk-in client:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling:
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1606S_022521	2/25/21	1347		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-145138 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by:	Arcadis	2/25/21 1710	Received by: Novi Cold Storage	Arcadis	2/25/21 1710
Relinquished by:	Arcadis	2/26/2021 /	Received by:	ETA	2/26/21 093
Relinquished by:	ETA	2/26/21 0931	Received in Laboratory by:	Company:	Date/Time:

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3/12/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 240-145138
Canton Facility

Client Arcadis Site Name

Cooler Received on FEB 27 2021 Opened on MAR 01 2021

Cooler unpacked by: MJS ETA CANTON

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # 1A Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam ~~Plastic Bag~~ None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.8 °C Corrected Cooler Temp. 1.9 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
   -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? Yes No
11. Sufficient quantity received to perform indicated analyses? Yes No
12. Are these work share samples and all listed on the COC? Yes No
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC907861
14. Were VOAs on the COC? Yes No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this. Yes No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # NA Yes No
17. Was a LL Hg or Me Hg trip blank present? Yes No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by: MJS ETA CANTON

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT



March 12, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 145138-1
Sample date: 2021-02-25
Report received by CADENA: 2021-03-12
Initial Data Verification completed by CADENA: 2021-03-12
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

> The matrix spike/matrix spike duplicate (MS/MSD) analytes were not reported, because the analyte list for these samples did not match the analyte list for the MS/MSD parent sample.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 145138-1

		Sample Name:	TRIP BLANK				MW-166S_022521			
		Lab Sample ID:	2401451381				2401451382			
		Sample Date:	2/25/2021				2/25/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS Design & Consultancy for natural and built assets

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

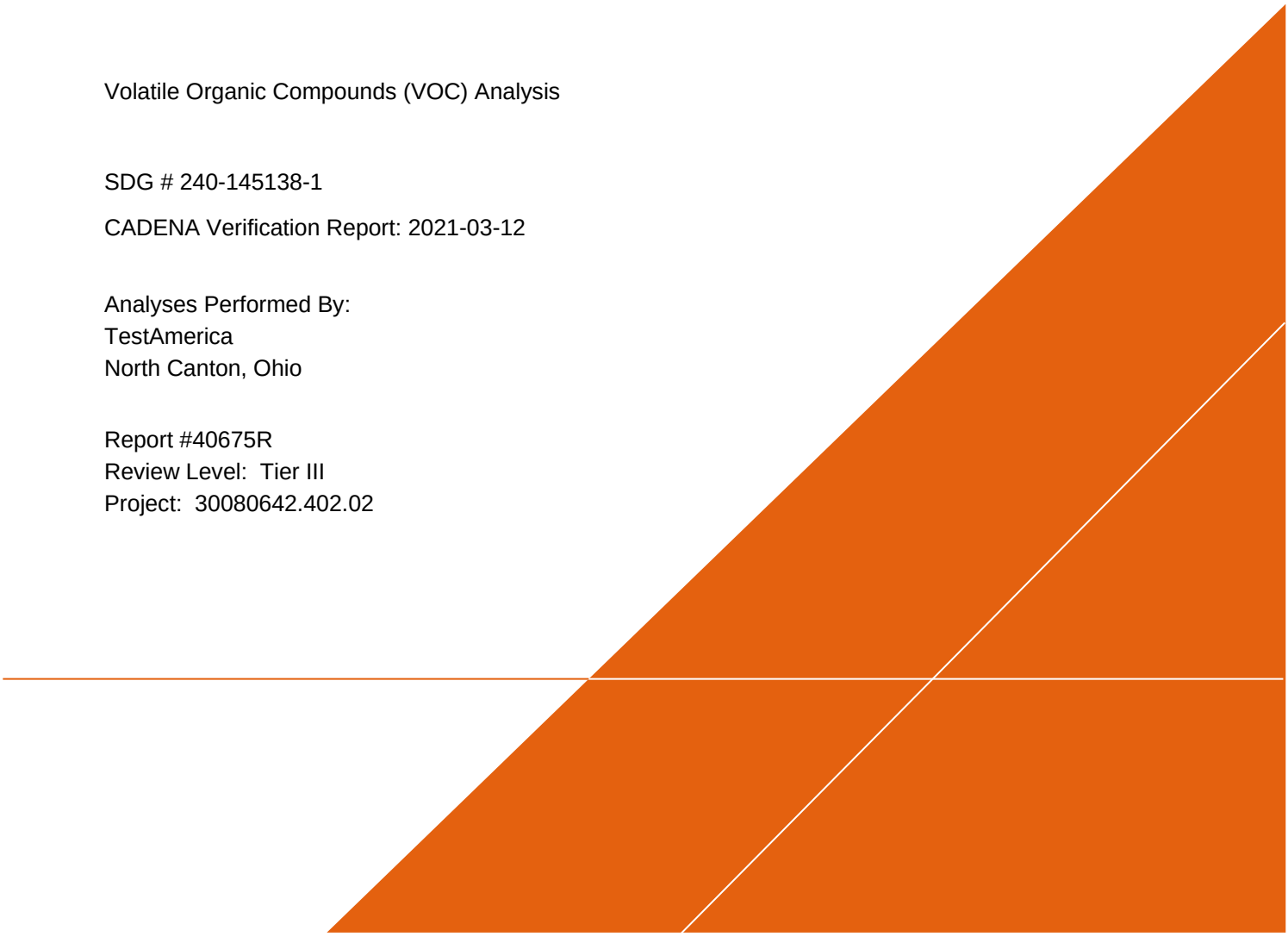
Volatile Organic Compounds (VOC) Analysis

SDG # 240-145138-1

CADENA Verification Report: 2021-03-12

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report #40675R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-145138-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					VOC
TRIP BLANK	240-145138-1	Water	02/25/2021		X
MW-166S_022521	240-145138-2	Water	02/25/2021		X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Prashanth K

SIGNATURE: 

DATE: March 25, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 29, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN
190

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name:	TAT if different from below: 10 day; ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client: Lab sampling: Job/SDG No:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			
Project Number: 30050315.402.04	Shipping/Tracking No:			
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1606S_022521	2/25/21	1347		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM



Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Arcadis	2/25/21 1710	Novi Cold Storage	Arcadis	2/25/21 1710
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Arcadis	2/26/2021		ETA	2/26/21 093
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
	ETA	2/26/21 0931			

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03/12/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-145138-1
Date Collected: 02/25/21 00:00
Matrix: Water
Date Received: 02/27/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 17:01	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 17:01	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 17:01	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 17:01	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 17:01	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 17:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*75 - 130*		*03/03/21 17:01*	*1*
4-Bromofluorobenzene (Surr)	*77*		*47 - 134*		*03/03/21 17:01*	*1*
Toluene-d8 (Surr)	*87*		*69 - 122*		*03/03/21 17:01*	*1*
Dibromofluoromethane (Surr)	*115*		*78 - 129*		*03/03/21 17:01*	*1*

Client Sample ID: MW-166S_022521
Lab Sample ID: 240-145138-2
Date Collected: 02/25/21 13:47
Matrix: Water
Date Received: 02/27/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/04/21 14:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*70 - 133*		*03/04/21 14:46*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 17:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 17:22	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 17:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 17:22	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 17:22	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 17:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*03/03/21 17:22*	*1*
4-Bromofluorobenzene (Surr)	*77*		*47 - 134*		*03/03/21 17:22*	*1*
Toluene-d8 (Surr)	*85*		*69 - 122*		*03/03/21 17:22*	*1*
Dibromofluoromethane (Surr)	*117*		*78 - 129*		*03/03/21 17:22*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144919-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/11/2021 4:43:47 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
Review your project results through TotalAccess
Have a Question? Ask The Expert
Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144919-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144919-1

Job ID: 240-144919-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144919-1

Comments
No additional comments.

Receipt
The samples were received on 2/25/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.7º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144919-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144919-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144919-1	TRIP BLANK	Water	02/23/21 00:00	02/25/21 08:00	
240-144919-2	MW-186S_022321	Water	02/23/21 10:15	02/25/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144919-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144919-1

No Detections.

Client Sample ID: MW-186S_022321 — Lab Sample ID: 240-144919-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144919-1

Client Sample ID: TRIP BLANK
Date Collected: 02/23/21 00:00
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144919-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 15:31	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 15:31	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 15:31	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 15:31	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 15:31	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 15:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*111*		*75 - 130*		*03/02/21 15:31*	*1*
4-Bromofluorobenzene (Surr)	*66*		*47 - 134*		*03/02/21 15:31*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*03/02/21 15:31*	*1*
Dibromofluoromethane (Surr)	*107*		*78 - 129*		*03/02/21 15:31*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144919-1

Client Sample ID: MW-186S_022321
Date Collected: 02/23/21 10:15
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144919-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 19:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 133*		*03/02/21 19:05*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 17:31	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 17:31	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 17:31	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 17:31	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 17:31	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 17:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*75 - 130*		*03/02/21 17:31*	*1*
4-Bromofluorobenzene (Surr)	*67*		*47 - 134*		*03/02/21 17:31*	*1*
Toluene-d8 (Surr)	*81*		*69 - 122*		*03/02/21 17:31*	*1*
Dibromofluoromethane (Surr)	*113*		*78 - 129*		*03/02/21 17:31*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144919-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144917-B-2 MS	Matrix Spike	89	90	90	91
240-144917-C-2 MSD	Matrix Spike Duplicate	88	90	102	89
240-144919-1	TRIP BLANK	111	66	92	107
240-144919-2	MW-186S_022321	105	67	81	113
LCS 240-475070/4	Lab Control Sample	91	92	91	94
MB 240-475070/7	Method Blank	107	77	81	108

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144919-2	MW-186S_022321	94
240-145076-O-2 MS	Matrix Spike	94
240-145076-O-2 MSD	Matrix Spike Duplicate	91
LCS 240-475052/4	Lab Control Sample	88
MB 240-475052/5	Method Blank	87

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475070/7
Matrix: Water
Analysis Batch: 475070

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 14:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 14:44	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 14:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 14:44	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 14:44	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 14:44	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*107*		*75 - 130*		*03/02/21 14:44*	*1*
4-Bromofluorobenzene (Surr)	*77*		*47 - 134*		*03/02/21 14:44*	*1*
Toluene-d8 (Surr)	*81*		*69 - 122*		*03/02/21 14:44*	*1*
Dibromofluoromethane (Surr)	*108*		*78 - 129*		*03/02/21 14:44*	*1*

Lab Sample ID: LCS 240-475070/4
Matrix: Water
Analysis Batch: 475070

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	11.0		ug/L		110	73 - 129
cis-1,2-Dichloroethene	10.0	9.24		ug/L		92	75 - 124
Tetrachloroethene	10.0	11.3		ug/L		113	70 - 125
trans-1,2-Dichloroethene	10.0	11.8		ug/L		118	74 - 130
Trichloroethene	10.0	9.62		ug/L		96	71 - 121
Vinyl chloride	10.0	10.8		ug/L		108	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*91*		*75 - 130*
4-Bromofluorobenzene (Surr)	*92*		*47 - 134*
Toluene-d8 (Surr)	*91*		*69 - 122*
Dibromofluoromethane (Surr)	*94*		*78 - 129*

Lab Sample ID: 240-144917-B-2 MS
Matrix: Water
Analysis Batch: 475070

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	11.2		ug/L		112	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	9.43		ug/L		94	68 - 121
Tetrachloroethene	1.0	U	10.0	12.3		ug/L		123	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	11.8		ug/L		118	69 - 126
Trichloroethene	1.0	U	10.0	9.86		ug/L		99	56 - 124
Vinyl chloride	1.0	U	10.0	10.7		ug/L		107	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*75 - 130*
4-Bromofluorobenzene (Surr)	*90*		*47 - 134*
Toluene-d8 (Surr)	*90*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144917-B-2 MS
Matrix: Water
Analysis Batch: 475070

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	*91*		*78 - 129*

Lab Sample ID: 240-144917-C-2 MSD
Matrix: Water
Analysis Batch: 475070

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	10.7		ug/L		107	64 - 132	4	35
cis-1,2-Dichloroethene	1.0	U	10.0	9.39		ug/L		94	68 - 121	0	35
Tetrachloroethene	1.0	U	10.0	11.7		ug/L		117	52 - 129	5	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.70		ug/L		97	69 - 126	19	35
Trichloroethene	1.0	U	10.0	10.7		ug/L		107	56 - 124	8	35
Vinyl chloride	1.0	U	10.0	11.2		ug/L		112	49 - 136	4	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 130*
4-Bromofluorobenzene (Surr)	*90*		*47 - 134*
Toluene-d8 (Surr)	*102*		*69 - 122*
Dibromofluoromethane (Surr)	*89*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475052/5
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 12:26	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*87*		*70 - 133*		*03/02/21 12:26*	*1*

Lab Sample ID: LCS 240-475052/4
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.00		ug/L		90	80 - 135

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 133*

Lab Sample ID: 240-145076-O-2 MS
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	9.73		ug/L		97	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 133*

Lab Sample ID: 240-145076-O-2 MSD
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.82		ug/L		98	46 - 170	1	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*91*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144919-1

GC/MS VOA

Analysis Batch: 475052

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144919-2	MW-186S_022321	Total/NA	Water	8260B SIM	
MB 240-475052/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-475052/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-145076-O-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-145076-O-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 475070

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144919-1	TRIP BLANK	Total/NA	Water	8260B	
240-144919-2	MW-186S_022321	Total/NA	Water	8260B	
MB 240-475070/7	Method Blank	Total/NA	Water	8260B	
LCS 240-475070/4	Lab Control Sample	Total/NA	Water	8260B	
240-144917-B-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144917-C-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144919-1

Client Sample ID: TRIP BLANK
Date Collected: 02/23/21 00:00
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144919-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475070	03/02/21 15:31	LRW	TAL CAN

Client Sample ID: MW-186S_022321
Date Collected: 02/23/21 10:15
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144919-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475070	03/02/21 17:31	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	475052	03/02/21 19:05	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144919-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

MICHIGAN 190 TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-1865 022321	2/23/21	1015		6						6					N	G	X	X	X	X	X	X	X	3 vocs for 8260B 3 vocs for 8260B SIM

240-144919 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Emma Witherspoon	Arcadis	2/23/21 1800	Novi cold storage	Arcadis	2/23/21 1800
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[illegible]	Arcadis	2/24/2021	Amanda Battershell	ETA	2/24/21 10:04
Relinquished by: Amanda Battershell	Company: ETA	Date/Time: 2/24/21 1404	Received in Laboratory by:	Company: ETA	Date/Time: 2-25-21 800

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3/11/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 144919
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Ryan C

Cooler Received on 2-25-21 Opened on 2-25-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2.6 °C Corrected Cooler Temp. 2.7 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. (Yes) No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 59072 (Yes) No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

One

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) MW-1865_022321 (1) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

WI-NC-099

DATA VERIFICATION REPORT

March 11, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144919-1
Sample date: 2021-02-23
Report received by CADENA: 2021-03-11
Initial Data Verification completed by CADENA: 2021-03-11
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144919-1

		Sample Name:	TRIP BLANK				MW-186S_022321			
		Lab Sample ID:	2401449191				2401449192			
		Sample Date:	2/23/2021				2/23/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

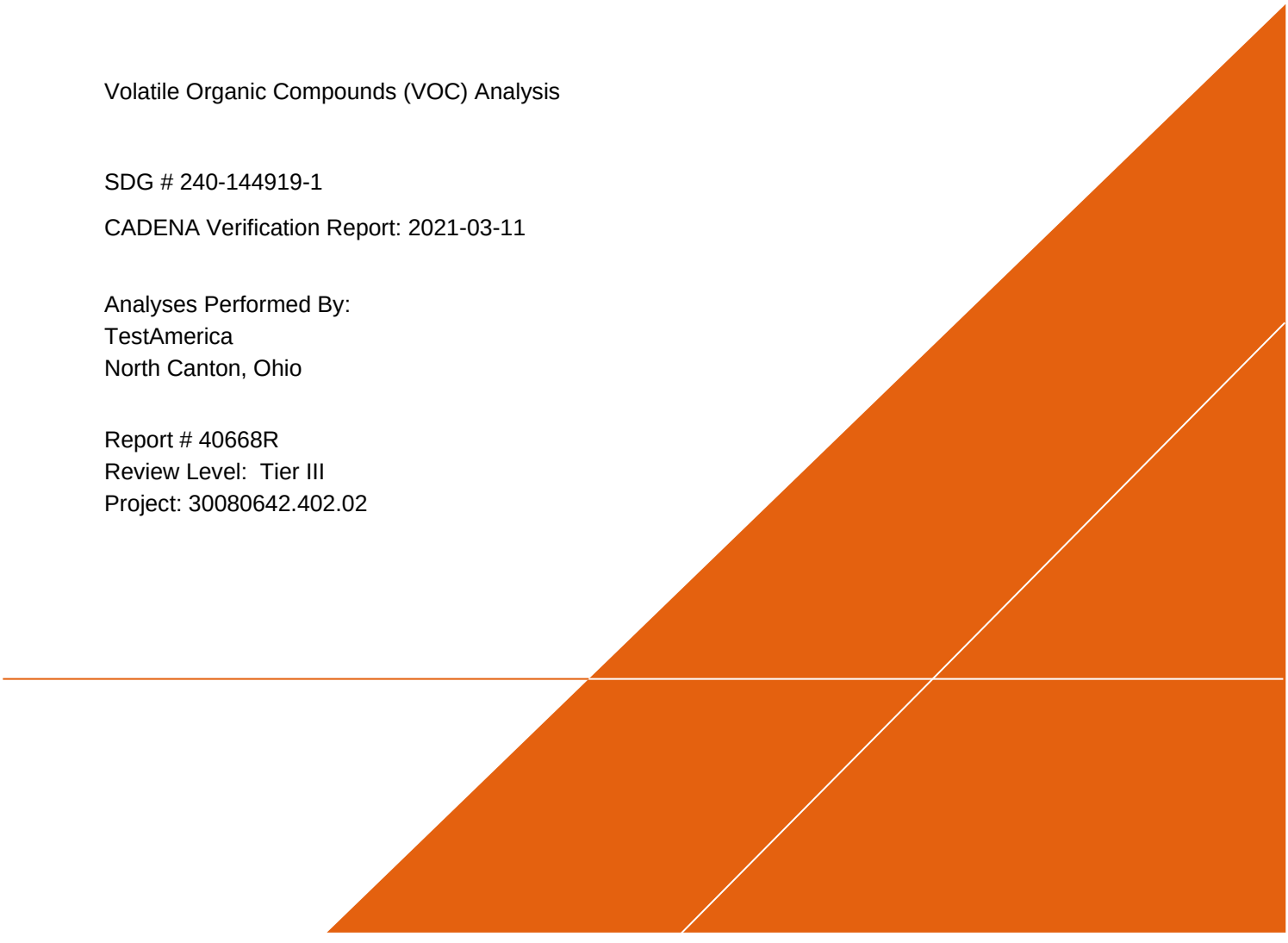
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144919-1

CADENA Verification Report: 2021-03-11

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40668R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144919-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144919-1	Water	02/23/2021		X	
MW-186S_022321	240-144919-2	Water	02/23/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

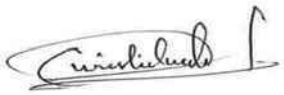
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 23, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 24, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190 TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:	10 day ✓ 2 weeks 3 weeks 1 week 2 days 1 day		Lab sampling
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-1865 022321	2/23/21	1015		6						6					N	G	X	X	X	X	X	X	X	3 vocs for 8260B 3 vocs for 8260B SIM

240-144919 Chain of Custody

Possible Hazard Identification
✓ Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Return to Client ✓ Disposal By Lab Archive For Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
E Witherspoon	Arcadis	2/23/21 1800	Novi cold storage	Arcadis	2/23/21 1800
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Arcadis	2/24/2021	Amanda Battershell	ETA	2/24/21 10:04
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
Amanda Battershell	ETA	2/24/21 1404		ETA	2-25-21 800

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03/11/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144919-1
Date Collected: 02/23/21 00:00
Matrix: Water
Date Received: 02/25/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 15:31	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 15:31	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 15:31	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 15:31	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 15:31	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 15:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*111*		*75 - 130*		*03/02/21 15:31*	*1*
4-Bromofluorobenzene (Surr)	*66*		*47 - 134*		*03/02/21 15:31*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*03/02/21 15:31*	*1*
Dibromofluoromethane (Surr)	*107*		*78 - 129*		*03/02/21 15:31*	*1*

Client Sample ID: MW-186S_022321
Lab Sample ID: 240-144919-2
Date Collected: 02/23/21 10:15
Matrix: Water
Date Received: 02/25/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 19:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 133*		*03/02/21 19:05*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 17:31	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 17:31	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 17:31	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 17:31	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 17:31	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 17:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*75 - 130*		*03/02/21 17:31*	*1*
4-Bromofluorobenzene (Surr)	*67*		*47 - 134*		*03/02/21 17:31*	*1*
Toluene-d8 (Surr)	*81*		*69 - 122*		*03/02/21 17:31*	*1*
Dibromofluoromethane (Surr)	*113*		*78 - 129*		*03/02/21 17:31*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144805-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/10/2021 9:00:07 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144805-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144805-1

Job ID: 240-144805-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144805-1

Comments
No additional comments.

Receipt
The samples were received on 2/24/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.3º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144805-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144805-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144805-1	TRIP BLANK	Water	02/22/21 00:00	02/24/21 08:00	
240-144805-2	MW-187S_022221	Water	02/22/21 13:00	02/24/21 08:00	
240-144805-3	MW-187_022221	Water	02/22/21 11:00	02/24/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144805-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144805-1

No Detections.

Client Sample ID: MW-187S_022221 — Lab Sample ID: 240-144805-2

No Detections.

Client Sample ID: MW-187_022221 — Lab Sample ID: 240-144805-3

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144805-1

Client Sample ID: TRIP BLANK
Date Collected: 02/22/21 00:00
Date Received: 02/24/21 08:00

Lab Sample ID: 240-144805-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 17:02	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 17:02	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 17:02	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 17:02	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 17:02	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 17:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*109*		*75 - 130*		*03/01/21 17:02*	*1*
4-Bromofluorobenzene (Surr)	*71*		*47 - 134*		*03/01/21 17:02*	*1*
Toluene-d8 (Surr)	*81*		*69 - 122*		*03/01/21 17:02*	*1*
Dibromofluoromethane (Surr)	*106*		*78 - 129*		*03/01/21 17:02*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144805-1

Client Sample ID: MW-187S_022221
Date Collected: 02/22/21 13:00
Date Received: 02/24/21 08:00

Lab Sample ID: 240-144805-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 20:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*70 - 133*		*02/26/21 20:29*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 17:26	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 17:26	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 17:26	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 17:26	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 17:26	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 17:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*75 - 130*		*03/01/21 17:26*	*1*
4-Bromofluorobenzene (Surr)	*66*		*47 - 134*		*03/01/21 17:26*	*1*
Toluene-d8 (Surr)	*84*		*69 - 122*		*03/01/21 17:26*	*1*
Dibromofluoromethane (Surr)	*108*		*78 - 129*		*03/01/21 17:26*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144805-1

Client Sample ID: MW-187_022221
Date Collected: 02/22/21 11:00
Date Received: 02/24/21 08:00

Lab Sample ID: 240-144805-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 13:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*		*03/01/21 13:02*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 17:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 17:50	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 17:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 17:50	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 17:50	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 17:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*75 - 130*		*03/01/21 17:50*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*03/01/21 17:50*	*1*
Toluene-d8 (Surr)	*82*		*69 - 122*		*03/01/21 17:50*	*1*
Dibromofluoromethane (Surr)	*113*		*78 - 129*		*03/01/21 17:50*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144805-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144805-1	TRIP BLANK	109	71	81	106
240-144805-2	MW-187S_022221	110	66	84	108
240-144805-3	MW-187_022221	112	65	82	113
240-144807-G-4 MS	Matrix Spike	92	91	89	96
240-144807-H-4 MSD	Matrix Spike Duplicate	86	91	88	90
LCS 240-474892/4	Lab Control Sample	88	89	89	89
MB 240-474892/7	Method Blank	104	70	82	110

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144711-O-2 MS	Matrix Spike	85
240-144711-O-2 MSD	Matrix Spike Duplicate	86
240-144805-2	MW-187S_022221	91
240-144805-3	MW-187_022221	86
240-144807-J-4 MS	Matrix Spike	90
240-144807-J-4 MSD	Matrix Spike Duplicate	88
LCS 240-474631/4	Lab Control Sample	82
LCS 240-474842/4	Lab Control Sample	90
MB 240-474631/5	Method Blank	80
MB 240-474842/5	Method Blank	86

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474892/7
Matrix: Water
Analysis Batch: 474892

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 15:51	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 15:51	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 15:51	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 15:51	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 15:51	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 15:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*03/01/21 15:51*	*1*
4-Bromofluorobenzene (Surr)	*70*		*47 - 134*		*03/01/21 15:51*	*1*
Toluene-d8 (Surr)	*82*		*69 - 122*		*03/01/21 15:51*	*1*
Dibromofluoromethane (Surr)	*110*		*78 - 129*		*03/01/21 15:51*	*1*

Lab Sample ID: LCS 240-474892/4
Matrix: Water
Analysis Batch: 474892

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.84		ug/L		98	73 - 129
cis-1,2-Dichloroethene	10.0	9.22		ug/L		92	75 - 124
Tetrachloroethene	10.0	10.9		ug/L		109	70 - 125
trans-1,2-Dichloroethene	10.0	9.78		ug/L		98	74 - 130
Trichloroethene	10.0	9.30		ug/L		93	71 - 121
Vinyl chloride	10.0	9.80		ug/L		98	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 130*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*
Toluene-d8 (Surr)	*89*		*69 - 122*
Dibromofluoromethane (Surr)	*89*		*78 - 129*

Lab Sample ID: 240-144807-G-4 MS
Matrix: Water
Analysis Batch: 474892

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.25		ug/L		93	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	9.38		ug/L		94	68 - 121
Tetrachloroethene	1.0	U	10.0	11.7		ug/L		117	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.98		ug/L		100	69 - 126
Trichloroethene	1.0	U	10.0	9.60		ug/L		96	56 - 124
Vinyl chloride	1.0	U	10.0	10.4		ug/L		104	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*
Toluene-d8 (Surr)	*89*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144807-G-4 MS
Matrix: Water
Analysis Batch: 474892

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	96		78 - 129

Lab Sample ID: 240-144807-H-4 MSD
Matrix: Water
Analysis Batch: 474892

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.00		ug/L		90	64 - 132	3	35
cis-1,2-Dichloroethene	1.0	U	10.0	8.99		ug/L		90	68 - 121	4	35
Tetrachloroethene	1.0	U	10.0	11.0		ug/L		110	52 - 129	6	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.43		ug/L		94	69 - 126	6	35
Trichloroethene	1.0	U	10.0	9.01		ug/L		90	56 - 124	6	35
Vinyl chloride	1.0	U	10.0	10.1		ug/L		101	49 - 136	3	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	86		75 - 130
4-Bromofluorobenzene (Surr)	91		47 - 134
Toluene-d8 (Surr)	88		69 - 122
Dibromofluoromethane (Surr)	90		78 - 129

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474631/5
Matrix: Water
Analysis Batch: 474631

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 10:51	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	80		70 - 133		02/26/21 10:51	1

Lab Sample ID: LCS 240-474631/4
Matrix: Water
Analysis Batch: 474631

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.80		ug/L		98	80 - 135

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	82		70 - 133

Lab Sample ID: 240-144711-O-2 MS
Matrix: Water
Analysis Batch: 474631

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	9.26		ug/L		93	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	85		70 - 133

Lab Sample ID: 240-144711-O-2 MSD
Matrix: Water
Analysis Batch: 474631

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.91		ug/L		99	46 - 170	7	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	86		70 - 133

Lab Sample ID: MB 240-474842/5
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 12:12	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	86		70 - 133		03/01/21 12:12	1

Lab Sample ID: LCS 240-474842/4
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	9.05		ug/L		91	80 - 135		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	90		70 - 133

Lab Sample ID: 240-144807-J-4 MS
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	8.95		ug/L		90	46 - 170		

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	90		70 - 133

Lab Sample ID: 240-144807-J-4 MSD
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.28		ug/L		93	46 - 170	4	26

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144807-J-4 MSD
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144805-1

GC/MS VOA

Analysis Batch: 474631

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144805-2	MW-187S_022221	Total/NA	Water	8260B SIM	
MB 240-474631/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474631/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144711-O-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144711-O-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474842

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144805-3	MW-187_022221	Total/NA	Water	8260B SIM	
MB 240-474842/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474842/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144807-J-4 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144807-J-4 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474892

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144805-1	TRIP BLANK	Total/NA	Water	8260B	
240-144805-2	MW-187S_022221	Total/NA	Water	8260B	
240-144805-3	MW-187_022221	Total/NA	Water	8260B	
MB 240-474892/7	Method Blank	Total/NA	Water	8260B	
LCS 240-474892/4	Lab Control Sample	Total/NA	Water	8260B	
240-144807-G-4 MS	Matrix Spike	Total/NA	Water	8260B	
240-144807-H-4 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144805-1

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144805-1
Date Collected: 02/22/21 00:00
Matrix: Water
Date Received: 02/24/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474892	03/01/21 17:02	LRW	TAL CAN

Client Sample ID: MW-187S_022221
Lab Sample ID: 240-144805-2
Date Collected: 02/22/21 13:00
Matrix: Water
Date Received: 02/24/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474892	03/01/21 17:26	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474631	02/26/21 20:29	SAM	TAL CAN

Client Sample ID: MW-187_022221
Lab Sample ID: 240-144805-3
Date Collected: 02/22/21 11:00
Matrix: Water
Date Received: 02/24/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474892	03/01/21 17:50	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474842	03/01/21 13:02	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144805-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

1-2/1-3

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No:
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below	of COCs
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:	10 day / 3 weeks / 2 weeks / 1 week / 2 days / 1 day	For lab use only
Project Number: 30050315.402.04	Shipping/Tracking No:		Walk-in client
PO # 30050315.402.04			Lab sampling
			Job/SDG No:

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-187S_022221	2/22/21	1300		6						6					N	G	X	X	X	X	X	X	X	3 vocs for 8260B 3 vocs for 8260B SIM
MW-167_022221	2/22/21	1100		6						6					N	G	X	X	X	X	X	X	X	+

240-144805 Chain of Custody

Possible Hazard Identification: Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / Disposal By Lab / Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by: Emma Witherspoon	Arcadis	2/22/21 1740	Novi cold Storage	Arcadis	2/22/21 1740
Relinquished by: Kyler McClafferty	Arcadis	2/23/21	Received by: Amanda Battershell	Company: ETA	Date/Time: 2/23/21 10:04
Relinquished by: Amanda Battershell	Company: ETA	Date/Time: 2/23/21 10:47	Received in Laboratory by:	Company: TA	Date/Time: 2-24-21 800

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3/10/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 142805
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by:

Cooler Received on 2-24-21 Opened on 2-24-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1-2 °C Corrected Cooler Temp. 1-3 °C

IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC907861
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

_____

_____

_____

_____

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

March 10, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144805-1
Sample date: 2021-02-22
Report received by CADENA: 2021-03-10
Initial Data Verification completed by CADENA: 2021-03-10
Number of Samples:3
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144805-1

		Sample Name:	TRIP BLANK				MW-187S_022221				MW-187_022221			
		Lab Sample ID:	2401448051				2401448052				2401448053			
		Sample Date:	2/22/2021				2/22/2021				2/22/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC													
OSW-8260B													
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim													
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

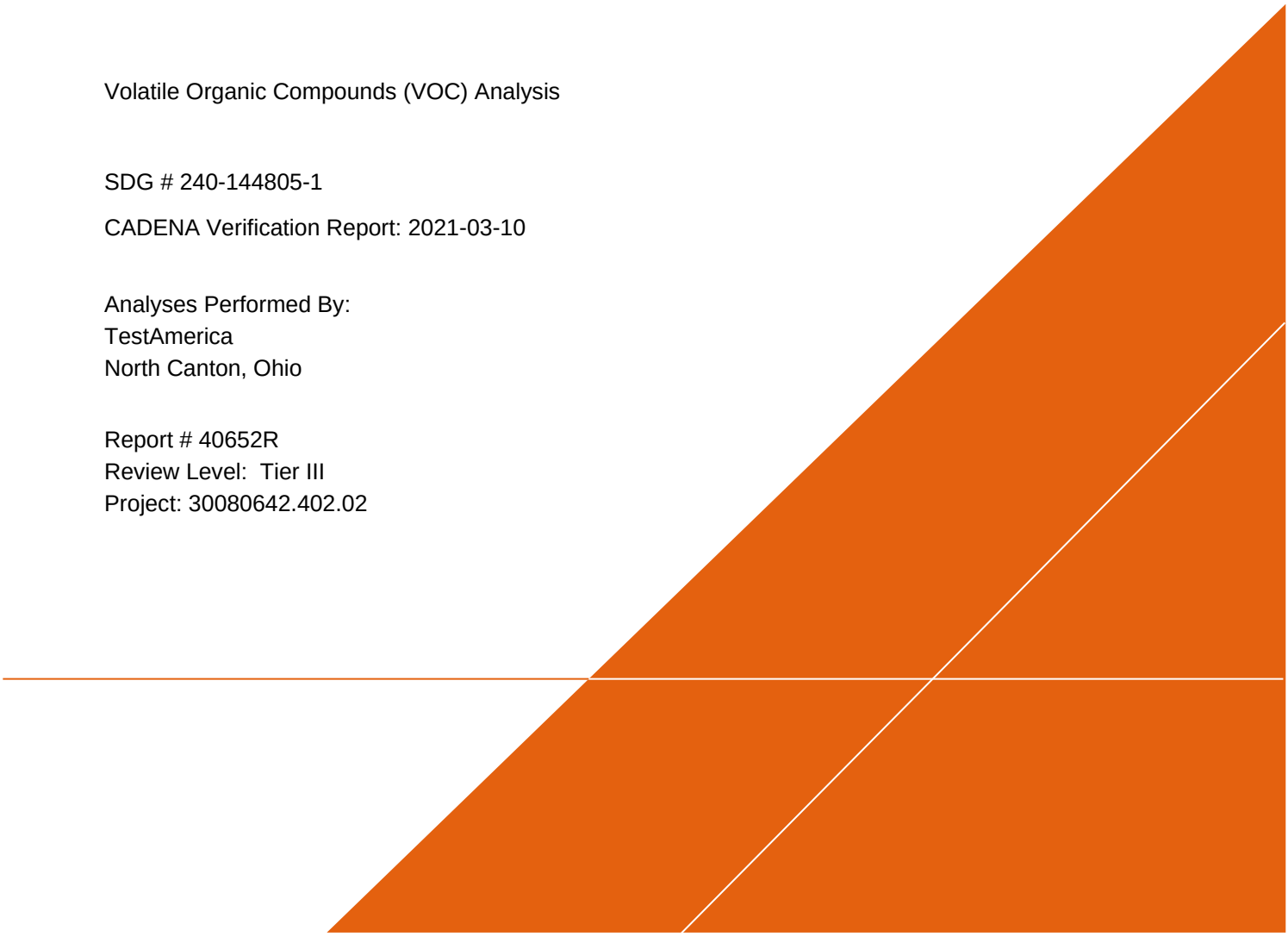
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144805-1

CADENA Verification Report: 2021-03-10

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40652R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144805-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144805-1	Water	02/22/2021		X	
MW-187S_022221	240-144805-2	Water	02/22/2021		X	X
MW-187_022221	240-144805-3	Water	02/22/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial/Continuing	Compound	Criteria
TRIP BLANK MW-187S_022221 MW-187_022221	CCV %D	Tetrachloroethene	+21.9%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R

Initial/Continuing	Criteria	Sample Result	Qualification
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1] RRF of 0.01 only applies to compounds which are typically poor responding compounds (i.e., ketones, 1,4-dioxane, etc.)

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

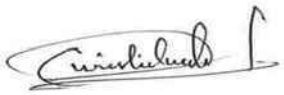
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 22, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 24, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

1-2/1-3

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No:
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day	of COCs
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		For lab use only: Walk-in client; Lab sampling; Job/SDG No:
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn/Ac/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-187S_022221	2/22/21	1300		6						6					N	G	X	X	X	X	X	X	X	3 vocs for 8260B; 3vocs for 8260B SIM
MW-187_022221	2/22/21	1100		6						6					N	G	X	X	X	X	X	X	X	+

240-144805 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Elizabeth Spencer	Arcadis	2/22/21 1740	Novi cold Storage	Arcadis	2/22/21 1740
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[illegible] McClafferty	Arcadis	2/23/21	Amanda Battershell	ETA	2/23/21 10:04
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
Amanda Battershell	ETA	2/23/21 10:47		TA	2-24-21 800

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03/10/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144805-1
Date Collected: 02/22/21 00:00
Matrix: Water
Date Received: 02/24/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 17:02	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 17:02	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 17:02	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 17:02	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 17:02	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 17:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*109*		*75 - 130*		*03/01/21 17:02*	*1*
4-Bromofluorobenzene (Surr)	*71*		*47 - 134*		*03/01/21 17:02*	*1*
Toluene-d8 (Surr)	*81*		*69 - 122*		*03/01/21 17:02*	*1*
Dibromofluoromethane (Surr)	*106*		*78 - 129*		*03/01/21 17:02*	*1*

Client Sample ID: MW-187S_022221
Lab Sample ID: 240-144805-2
Date Collected: 02/22/21 13:00
Matrix: Water
Date Received: 02/24/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 20:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*70 - 133*		*02/26/21 20:29*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 17:26	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 17:26	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 17:26	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 17:26	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 17:26	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 17:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*75 - 130*		*03/01/21 17:26*	*1*
4-Bromofluorobenzene (Surr)	*66*		*47 - 134*		*03/01/21 17:26*	*1*
Toluene-d8 (Surr)	*84*		*69 - 122*		*03/01/21 17:26*	*1*
Dibromofluoromethane (Surr)	*108*		*78 - 129*		*03/01/21 17:26*	*1*

Client Sample ID: MW-187_022221
Lab Sample ID: 240-144805-3
Date Collected: 02/22/21 11:00
Matrix: Water
Date Received: 02/24/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 13:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*		*03/01/21 13:02*	*1*

Client Sample ID: MW-187_022221
Lab Sample ID: 240-144805-3
Date Collected: 02/22/21 11:00
Matrix: Water
Date Received: 02/24/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 17:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 17:50	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 17:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 17:50	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 17:50	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 17:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*75 - 130*		*03/01/21 17:50*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*03/01/21 17:50*	*1*
Toluene-d8 (Surr)	*82*		*69 - 122*		*03/01/21 17:50*	*1*
Dibromofluoromethane (Surr)	*113*		*78 - 129*		*03/01/21 17:50*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144370-1
Client Project/Site: Ford LTP - Off Site
Revision: 1

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/26/2021 9:34:08 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144370-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144370-1

Job ID: 240-144370-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144370-1

Comments
No additional comments.

Revision
The report being provided is a revision of the original report sent on 2/19/2021. The report (revision 1) is being revised due to: Samples mislabeled during unpacking - revised to correct data.

Receipt
The samples were received on 2/11/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.2º C.

GC/MS VOA
Method 8260B: The following sample was analyzed outside of analytical holding time due to mis-labeled vial: TRIP BLANK (240-144370-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144370-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144370-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144370-1	TRIP BLANK	Water	02/09/21 00:00	02/11/21 08:00	
240-144370-2	MW-214S_020921	Water	02/09/21 10:45	02/11/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144370-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144370-1

No Detections.

Client Sample ID: MW-214S_020921 — Lab Sample ID: 240-144370-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144370-1

Client Sample ID: TRIP BLANK
Date Collected: 02/09/21 00:00
Date Received: 02/11/21 08:00

Lab Sample ID: 240-144370-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U H	1.0	0.19	ug/L			03/15/21 19:25	1
cis-1,2-Dichloroethene	1.0	U H	1.0	0.16	ug/L			03/15/21 19:25	1
Tetrachloroethene	1.0	U H	1.0	0.15	ug/L			03/15/21 19:25	1
trans-1,2-Dichloroethene	1.0	U H	1.0	0.19	ug/L			03/15/21 19:25	1
Trichloroethene	1.0	U H	1.0	0.10	ug/L			03/15/21 19:25	1
Vinyl chloride	1.0	U H	1.0	0.20	ug/L			03/15/21 19:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*75 - 130*		*03/15/21 19:25*	*1*
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*		*03/15/21 19:25*	*1*
Toluene-d8 (Surr)	*99*		*69 - 122*		*03/15/21 19:25*	*1*
Dibromofluoromethane (Surr)	*84*		*78 - 129*		*03/15/21 19:25*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144370-1

Client Sample ID: MW-214S_020921
Date Collected: 02/09/21 10:45
Date Received: 02/11/21 08:00

Lab Sample ID: 240-144370-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 20:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*		*02/12/21 20:03*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 14:11	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 14:11	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 14:11	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 14:11	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 14:11	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 14:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*75 - 130*		*02/15/21 14:11*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*02/15/21 14:11*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*02/15/21 14:11*	*1*
Dibromofluoromethane (Surr)	*111*		*78 - 129*		*02/15/21 14:11*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144370-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
190-25454-E-1 MS	Matrix Spike	79	97	95	83
190-25454-F-1 MSD	Matrix Spike Duplicate	84	95	95	86
240-144370-1	TRIP BLANK	82	96	99	84
240-144370-2	MW-214S_020921	106	65	80	111
240-144376-H-3 MS	Matrix Spike	93	95	93	95
240-144376-I-3 MSD	Matrix Spike Duplicate	86	86	85	91
LCS 240-473065/4	Lab Control Sample	89	93	91	93
LCS 240-476776/4	Lab Control Sample	78	94	97	83
MB 240-473065/7	Method Blank	103	70	83	105
MB 240-476776/7	Method Blank	80	91	98	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144370-2	MW-214S_020921	84
240-144376-F-3 MS	Matrix Spike	83
240-144376-F-3 MSD	Matrix Spike Duplicate	82
LCS 240-472900/4	Lab Control Sample	82
MB 240-472900/5	Method Blank	82

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473065/7
Matrix: Water
Analysis Batch: 473065

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 11:48	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 11:48	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 11:48	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 11:48	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 11:48	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 11:48	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*75 - 130*		*02/15/21 11:48*	*1*
4-Bromofluorobenzene (Surr)	*70*		*47 - 134*		*02/15/21 11:48*	*1*
Toluene-d8 (Surr)	*83*		*69 - 122*		*02/15/21 11:48*	*1*
Dibromofluoromethane (Surr)	*105*		*78 - 129*		*02/15/21 11:48*	*1*

Lab Sample ID: LCS 240-473065/4
Matrix: Water
Analysis Batch: 473065

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.81		ug/L		98	73 - 129
cis-1,2-Dichloroethene	10.0	9.60		ug/L		96	75 - 124
Tetrachloroethene	10.0	11.2		ug/L		112	70 - 125
trans-1,2-Dichloroethene	10.0	10.3		ug/L		103	74 - 130
Trichloroethene	10.0	10.1		ug/L		101	71 - 121
Vinyl chloride	10.0	8.27		ug/L		83	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*75 - 130*
4-Bromofluorobenzene (Surr)	*93*		*47 - 134*
Toluene-d8 (Surr)	*91*		*69 - 122*
Dibromofluoromethane (Surr)	*93*		*78 - 129*

Lab Sample ID: 240-144376-H-3 MS
Matrix: Water
Analysis Batch: 473065

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.84		ug/L		98	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	9.69		ug/L		97	68 - 121
Tetrachloroethene	1.0	U	10.0	10.8		ug/L		108	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.85		ug/L		98	69 - 126
Trichloroethene	1.0	U	10.0	9.18		ug/L		92	56 - 124
Vinyl chloride	1.0	U	10.0	8.01		ug/L		80	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144376-H-3 MS
Matrix: Water
Analysis Batch: 473065

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	95		78 - 129

Lab Sample ID: 240-144376-I-3 MSD
Matrix: Water
Analysis Batch: 473065

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.36		ug/L		94	64 - 132	5	35
cis-1,2-Dichloroethene	1.0	U	10.0	9.44		ug/L		94	68 - 121	3	35
Tetrachloroethene	1.0	U	10.0	9.39		ug/L		94	52 - 129	14	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.90		ug/L		99	69 - 126	1	35
Trichloroethene	1.0	U	10.0	9.24		ug/L		92	56 - 124	1	35
Vinyl chloride	1.0	U	10.0	8.23		ug/L		82	49 - 136	3	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	86		75 - 130
4-Bromofluorobenzene (Surr)	86		47 - 134
Toluene-d8 (Surr)	85		69 - 122
Dibromofluoromethane (Surr)	91		78 - 129

Lab Sample ID: MB 240-476776/7
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/15/21 15:40	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/15/21 15:40	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/15/21 15:40	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/15/21 15:40	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/15/21 15:40	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/15/21 15:40	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	80		75 - 130		03/15/21 15:40	1
4-Bromofluorobenzene (Surr)	91		47 - 134		03/15/21 15:40	1
Toluene-d8 (Surr)	98		69 - 122		03/15/21 15:40	1
Dibromofluoromethane (Surr)	81		78 - 129		03/15/21 15:40	1

Lab Sample ID: LCS 240-476776/4
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.48		ug/L		85	73 - 129
cis-1,2-Dichloroethene	10.0	9.17		ug/L		92	75 - 124
Tetrachloroethene	10.0	10.2		ug/L		102	70 - 125
trans-1,2-Dichloroethene	10.0	8.93		ug/L		89	74 - 130
Trichloroethene	10.0	8.97		ug/L		90	71 - 121

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-476776/4
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Vinyl chloride			10.0	11.1		ug/L		111	61 - 134		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*78*		*75 - 130*
4-Bromofluorobenzene (Surr)	*94*		*47 - 134*
Toluene-d8 (Surr)	*97*		*69 - 122*
Dibromofluoromethane (Surr)	*83*		*78 - 129*

Lab Sample ID: 190-25454-E-1 MS
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,1-Dichloroethene	1.0	U	10.0	6.81		ug/L		68	64 - 132		
cis-1,2-Dichloroethene	1.0	U	10.0	7.96		ug/L		80	68 - 121		
Tetrachloroethene	1.0	U	10.0	8.88		ug/L		89	52 - 129		
trans-1,2-Dichloroethene	1.0	U	10.0	7.48		ug/L		75	69 - 126		
Trichloroethene	1.0	U	10.0	7.78		ug/L		78	56 - 124		
Vinyl chloride	1.0	U	10.0	9.92		ug/L		99	49 - 136		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*75 - 130*
4-Bromofluorobenzene (Surr)	*97*		*47 - 134*
Toluene-d8 (Surr)	*95*		*69 - 122*
Dibromofluoromethane (Surr)	*83*		*78 - 129*

Lab Sample ID: 190-25454-F-1 MSD
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	6.82		ug/L		68	64 - 132	0	35
cis-1,2-Dichloroethene	1.0	U	10.0	8.09		ug/L		81	68 - 121	2	35
Tetrachloroethene	1.0	U	10.0	8.78		ug/L		88	52 - 129	1	35
trans-1,2-Dichloroethene	1.0	U	10.0	7.87		ug/L		79	69 - 126	5	35
Trichloroethene	1.0	U	10.0	8.10		ug/L		81	56 - 124	4	35
Vinyl chloride	1.0	U	10.0	10.4		ug/L		104	49 - 136	4	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*95*		*69 - 122*
Dibromofluoromethane (Surr)	*86*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-472900/5
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 12:29	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/12/21 12:29*	*1*

Lab Sample ID: LCS 240-472900/4
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.6		ug/L		106	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144376-F-3 MS
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	10.8		ug/L		108	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*

Lab Sample ID: 240-144376-F-3 MSD
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.8		ug/L		108	46 - 170	1	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144370-1

GC/MS VOA

Analysis Batch: 472900

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144370-2	MW-214S_020921	Total/NA	Water	8260B SIM	
MB 240-472900/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-472900/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144376-F-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144376-F-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 473065

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144370-2	MW-214S_020921	Total/NA	Water	8260B	
MB 240-473065/7	Method Blank	Total/NA	Water	8260B	
LCS 240-473065/4	Lab Control Sample	Total/NA	Water	8260B	
240-144376-H-3 MS	Matrix Spike	Total/NA	Water	8260B	
240-144376-I-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 476776

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144370-1	TRIP BLANK	Total/NA	Water	8260B	
MB 240-476776/7	Method Blank	Total/NA	Water	8260B	
LCS 240-476776/4	Lab Control Sample	Total/NA	Water	8260B	
190-25454-E-1 MS	Matrix Spike	Total/NA	Water	8260B	
190-25454-F-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144370-1

Client Sample ID: TRIP BLANK
Date Collected: 02/09/21 00:00
Date Received: 02/11/21 08:00

Lab Sample ID: 240-144370-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	476776	03/15/21 19:25	LRW	TAL CAN

Client Sample ID: MW-214S_020921
Date Collected: 02/09/21 10:45
Date Received: 02/11/21 08:00

Lab Sample ID: 240-144370-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473065	02/15/21 14:11	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	472900	02/12/21 20:03	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144370-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190

TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Allyson Hartz	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:	10 day		Lab sampling:
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac / NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	---	---		1						1					N	G	X	X	X	X	X	X	X	1 TRIP BLANK
MW-2195-020921	2/9/21	10:45		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-144370 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
A Hartz	Arcadis	2/9/21 17:30	Novi cold storage	Arcadis	2/9/21 17:30
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Arcadis	2/10/21	Amanda Battershell	ETA	2/10/21 10:12
Relinquished by: Amanda Battershell	Company: ETA	Date/Time: 2/10/21 1309	Received in Laboratory by:	Company: ETA	Date/Time: 2-11-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 144370**
Canton Facility

Client Arcadis Site Name

Cooler Received on 2-11-21 Opened on 2-11-21

Cooler unpacked by: MattSnyder

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # VA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2.1 °C Corrected Cooler Temp. 2.2 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC907861
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 0303101F	Yes	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT



March 26, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144370-1
Sample date: 2021-02-09
Report received by CADENA: 2021-03-26
Initial Data Verification completed by CADENA: 2021-03-26
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

HTQ - GCMS VOC sample TRIP BLANK analysis was performed outside of reference holding time due to an initial sample mix-up so all associated results should be considered to be estimated and qualified with UJ flags if non-detect.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Qualified Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144370-1

Sample Name: TRIP BLANK
Lab Sample ID: 2401443701
Sample Date: 2/9/2021

Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC					
OSW-8260B					
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	UJ
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	UJ
Tetrachloroethene	127-18-4	ND	1.0	ug/l	UJ
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	UJ
Trichloroethene	79-01-6	ND	1.0	ug/l	UJ
Vinyl chloride	75-01-4	ND	1.0	ug/l	UJ

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144370-1

		Sample Name:	TRIP BLANK				MW-214S_020921			
		Lab Sample ID:	2401443701				2401443702			
		Sample Date:	2/9/2021				2/9/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS Design & Consultancy for natural and built assets

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

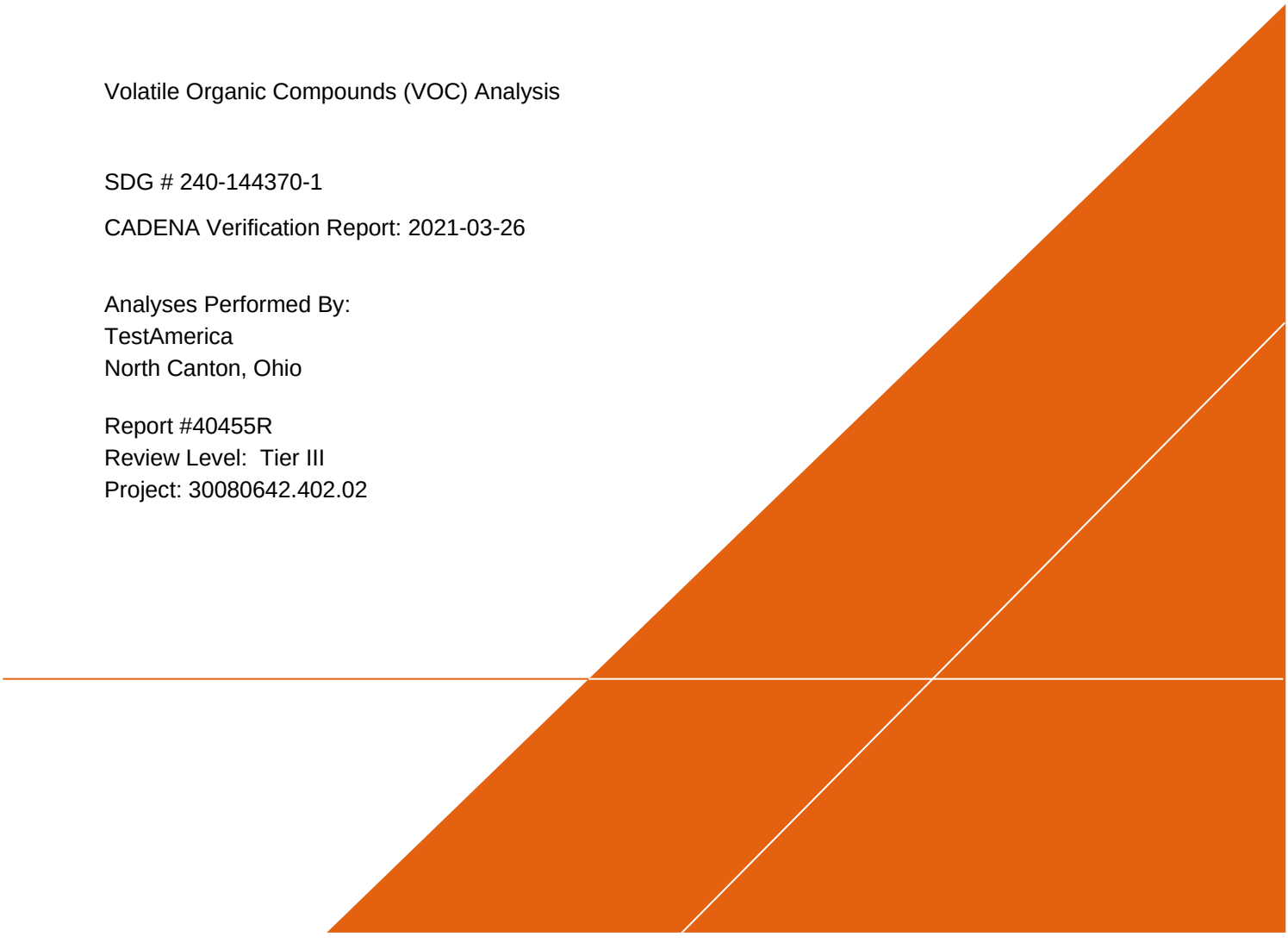
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144370-1

CADENA Verification Report: 2021-03-26

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report #40455R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144370-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					VOC
TRIP BLANK	240-144370-1	Water	02/09/2021		X
MW-214S_020921	240-144370-2	Water	02/09/2021		X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

The analyses that exceeded the holding are presented in the following table.

Sample ID	Holding Time	Criteria
TRIP BLANK	34 days	14 days from collection to analysis

Sample results associated with samples mentioned in the table above, analyzed by analytical method SW-846 8260B were qualified, as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

DATA REVIEW

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X	X		
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

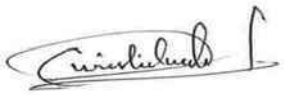
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 30, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 30, 2021

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190 — TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com			
Phone: 248-994-2240	Sampler Name: Allyson Hartz	Analysis Turnaround Time		For lab use only
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client:
Project Number: 30050315.402.04	Shipping/Tracking No:	10 day		Lab sampling:
PO # 30050315.402.04				Job/SDG No:

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zinc Acetate/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	---	---		1						1					N	G	X	X	X	X	X	X	X	1 TRIP BLANK
MW-2195-020921	2/9/21	10:45		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-144370 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
A Hartz	Arcadis	2/9/21 17:30	Novi Cold Storage	Arcadis	2/9/21 17:30
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	2/10/21	Leonard Battershell	ETA	2/10/21 10:12
Relinquished by: Leonard Battershell	Company: ETA	Date/Time: 2/10/21 1309	Received in Laboratory by:	Company: ETA	Date/Time: 2-11-21 800

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Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144370-1

Date Collected: 02/09/21 00:00
Matrix: Water
Date Received: 02/11/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
~~1,1-Dichloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.19~~	~~ug/L~~			~~03/15/21 19:25~~		R 1
~~cis-1,2-Dichloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.16~~	~~ug/L~~			~~03/15/21 19:25~~		R 1
~~Tetrachloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.15~~	~~ug/L~~			~~03/15/21 19:25~~		R 1
~~trans-1,2-Dichloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.19~~	~~ug/L~~			~~03/15/21 19:25~~		R 1
~~Trichloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.10~~	~~ug/L~~			~~03/15/21 19:25~~		R 1
~~Vinyl chloride~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.20~~	~~ug/L~~			~~03/15/21 19:25~~		R 1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*75 - 130*		*03/15/21 19:25*	*1*
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*		*03/15/21 19:25*	*1*
Toluene-d8 (Surr)	*99*		*69 - 122*		*03/15/21 19:25*	*1*
Dibromofluoromethane (Surr)	*84*		*78 - 129*		*03/15/21 19:25*	*1*

Client Sample ID: MW-214S_020921

Lab Sample ID: 240-144370-2

Date Collected: 02/09/21 10:45
Matrix: Water
Date Received: 02/11/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 20:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*		*02/12/21 20:03*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 14:11	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 14:11	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 14:11	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 14:11	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 14:11	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 14:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*75 - 130*		*02/15/21 14:11*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*02/15/21 14:11*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*02/15/21 14:11*	*1*
Dibromofluoromethane (Surr)	*111*		*78 - 129*		*02/15/21 14:11*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144817-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/10/2021 9:14:14 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
Review your project results through TotalAccess
Have a Question? Ask The Expert
Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144817-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144817-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144817-1

Comments
No additional comments.

Receipt
The samples were received on 2/24/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.3º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144817-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144817-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144817-1	TRIP BLANK	Water	02/22/21 00:00	02/24/21 08:00	
240-144817-2	MW-188S_022221	Water	02/22/21 15:15	02/24/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144817-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144817-1

No Detections.

Client Sample ID: MW-188S_022221 — Lab Sample ID: 240-144817-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144817-1

Client Sample ID: TRIP BLANK

Date Collected: 02/22/21 00:00
Date Received: 02/24/21 08:00

Lab Sample ID: 240-144817-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 15:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 15:07	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 15:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 15:07	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 15:07	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 15:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*03/02/21 15:07*	*1*
4-Bromofluorobenzene (Surr)	*78*		*47 - 134*		*03/02/21 15:07*	*1*
Toluene-d8 (Surr)	*88*		*69 - 122*		*03/02/21 15:07*	*1*
Dibromofluoromethane (Surr)	*112*		*78 - 129*		*03/02/21 15:07*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144817-1

Client Sample ID: MW-188S_022221
Date Collected: 02/22/21 15:15
Date Received: 02/24/21 08:00

Lab Sample ID: 240-144817-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 18:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*70 - 133*		*03/01/21 18:29*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 15:29	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 15:29	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 15:29	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 15:29	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 15:29	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 15:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*03/02/21 15:29*	*1*
4-Bromofluorobenzene (Surr)	*76*		*47 - 134*		*03/02/21 15:29*	*1*
Toluene-d8 (Surr)	*87*		*69 - 122*		*03/02/21 15:29*	*1*
Dibromofluoromethane (Surr)	*112*		*78 - 129*		*03/02/21 15:29*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144817-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144718-C-26 MS	Matrix Spike	84	94	92	100
240-144718-C-26 MSD	Matrix Spike Duplicate	84	96	94	101
240-144817-1	TRIP BLANK	101	78	88	112
240-144817-2	MW-188S_022221	100	76	87	112
LCS 240-475003/4	Lab Control Sample	87	95	94	101
MB 240-475003/7	Method Blank	97	82	89	108

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144807-J-4 MS	Matrix Spike	90
240-144807-J-4 MSD	Matrix Spike Duplicate	88
240-144817-2	MW-188S_022221	97
LCS 240-474842/4	Lab Control Sample	90
MB 240-474842/5	Method Blank	86

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475003/7
Matrix: Water
Analysis Batch: 475003

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 11:05	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 11:05	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 11:05	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 11:05	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 11:05	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 11:05	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*		*03/02/21 11:05*	*1*
4-Bromofluorobenzene (Surr)	*82*		*47 - 134*		*03/02/21 11:05*	*1*
Toluene-d8 (Surr)	*89*		*69 - 122*		*03/02/21 11:05*	*1*
Dibromofluoromethane (Surr)	*108*		*78 - 129*		*03/02/21 11:05*	*1*

Lab Sample ID: LCS 240-475003/4
Matrix: Water
Analysis Batch: 475003

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	12.4		ug/L		124	73 - 129
cis-1,2-Dichloroethene	10.0	11.0		ug/L		110	75 - 124
Tetrachloroethene	10.0	10.5		ug/L		105	70 - 125
trans-1,2-Dichloroethene	10.0	10.9		ug/L		109	74 - 130
Trichloroethene	10.0	10.2		ug/L		102	71 - 121
Vinyl chloride	10.0	10.6		ug/L		106	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*94*		*69 - 122*
Dibromofluoromethane (Surr)	*101*		*78 - 129*

Lab Sample ID: 240-144718-C-26 MS
Matrix: Water
Analysis Batch: 475003

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	21		100	132		ug/L		111	64 - 132
cis-1,2-Dichloroethene	56		100	160		ug/L		104	68 - 121
Tetrachloroethene	10	U	100	87.1		ug/L		87	52 - 129
trans-1,2-Dichloroethene	3.9	J	100	102		ug/L		98	69 - 126
Trichloroethene	250		100	319		ug/L		72	56 - 124
Vinyl chloride	3.3	J	100	80.0		ug/L		77	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*
4-Bromofluorobenzene (Surr)	*94*		*47 - 134*
Toluene-d8 (Surr)	*92*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144718-C-26 MS
Matrix: Water
Analysis Batch: 475003

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	*100*		*78 - 129*

Lab Sample ID: 240-144718-C-26 MSD
Matrix: Water
Analysis Batch: 475003

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	21		100	139		ug/L		119	64 - 132	6	35
cis-1,2-Dichloroethene	56		100	163		ug/L		107	68 - 121	2	35
Tetrachloroethene	10	U	100	95.7		ug/L		96	52 - 129	9	35
trans-1,2-Dichloroethene	3.9	J	100	108		ug/L		104	69 - 126	6	35
Trichloroethene	250		100	317		ug/L		70	56 - 124	1	35
Vinyl chloride	3.3	J	100	110		ug/L		107	49 - 136	32	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*
Toluene-d8 (Surr)	*94*		*69 - 122*
Dibromofluoromethane (Surr)	*101*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474842/5
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 12:12	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*		*03/01/21 12:12*	*1*

Lab Sample ID: LCS 240-474842/4
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.05		ug/L		91	80 - 135

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*90*		*70 - 133*

Lab Sample ID: 240-144807-J-4 MS
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	8.95		ug/L		90	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*90*		*70 - 133*

Lab Sample ID: 240-144807-J-4 MSD
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.28		ug/L		93	46 - 170	4	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144817-1

GC/MS VOA

Analysis Batch: 474842

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144817-2	MW-188S_022221	Total/NA	Water	8260B SIM	
MB 240-474842/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474842/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144807-J-4 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144807-J-4 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 475003

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144817-1	TRIP BLANK	Total/NA	Water	8260B	
240-144817-2	MW-188S_022221	Total/NA	Water	8260B	
MB 240-475003/7	Method Blank	Total/NA	Water	8260B	
LCS 240-475003/4	Lab Control Sample	Total/NA	Water	8260B	
240-144718-C-26 MS	Matrix Spike	Total/NA	Water	8260B	
240-144718-C-26 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144817-1

Client Sample ID: TRIP BLANK
Date Collected: 02/22/21 00:00
Date Received: 02/24/21 08:00

Lab Sample ID: 240-144817-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475003	03/02/21 15:07	LEE	TAL CAN

Client Sample ID: MW-188S_022221
Date Collected: 02/22/21 15:15
Date Received: 02/24/21 08:00

Lab Sample ID: 240-144817-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475003	03/02/21 15:29	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	474842	03/01/21 18:29	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144817-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

1-211.3

Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica MICHIGAN 190

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAcet/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM					Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X					1 Trip blank
MW-188S_022221	2/22/21	1515		6						6					N	G	X	X	X	X	X	X	X					3 vocs for 8260B 3vocs for 8260B SIM

240-144817 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Emma Witherspoon	Arcadis	2/22/21 1740	Novi cold Storage	Arcadis	2/22/21 1740
Julia McClafferty	Arcadis	2/23/2021	Amanda Battershell	ETA	2/23/21 10.04
Amanda Battershell	ETA	2/23/21 10.47	Received in Laboratory by:	TA	2-24-21 800

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3/10/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 44817
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by:

Cooler Received on 2-24-21 Opened on 2-24-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1-2 °C Corrected Cooler Temp. 1-3 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC907861
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page | Samples processed by:

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

March 10, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144817-1
Sample date: 2021-02-22
Report received by CADENA: 2021-03-10
Initial Data Verification completed by CADENA: 2021-03-10
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144817-1

		Sample Name:	TRIP BLANK				MW-188S_022221			
		Lab Sample ID:	2401448171				2401448172			
		Sample Date:	2/22/2021				2/22/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

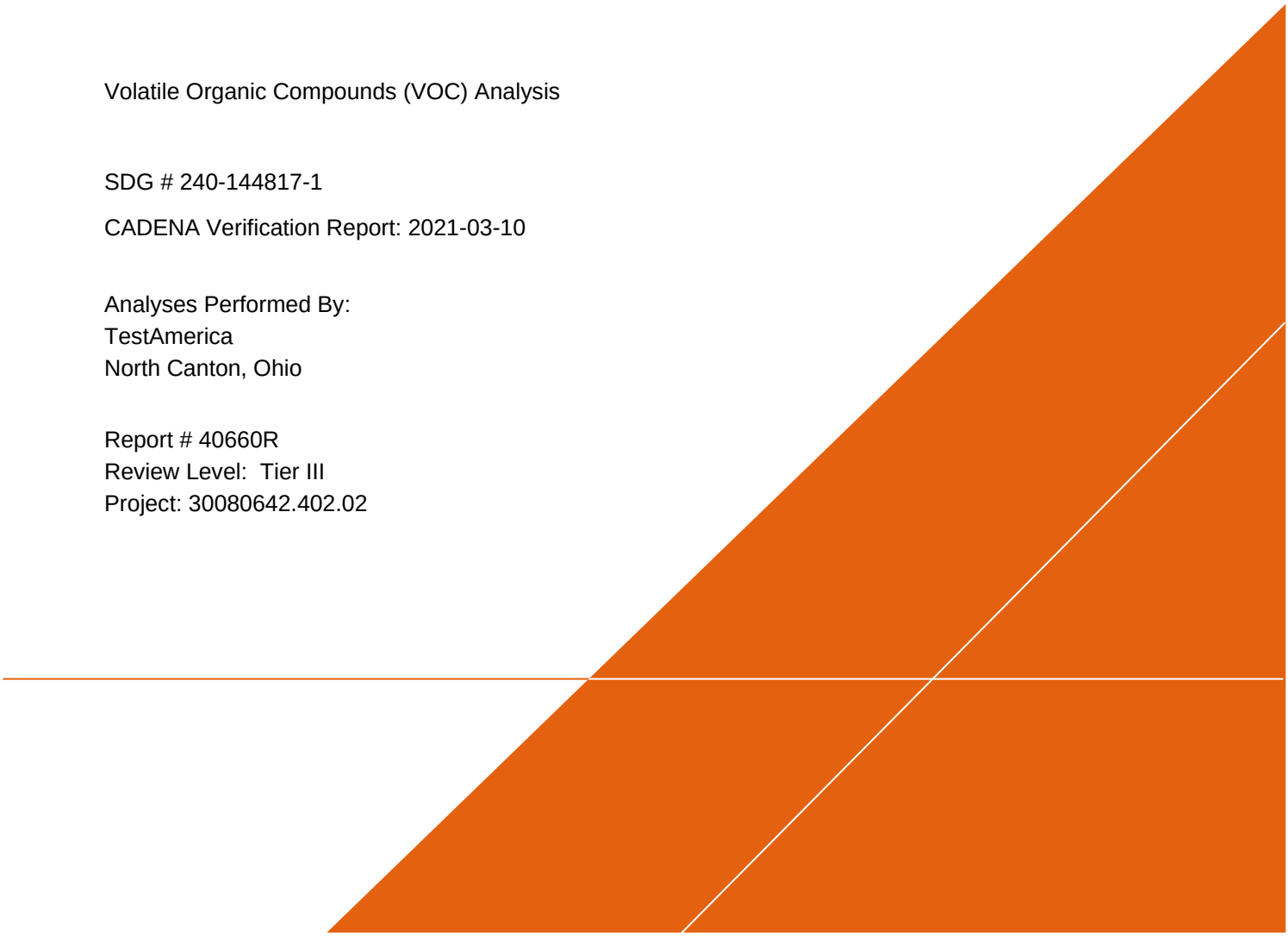
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144817-1

CADENA Verification Report: 2021-03-10

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40660R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144817-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144817-1	Water	02/22/2021		X	
MW-188S_022221	240-144817-2	Water	02/22/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

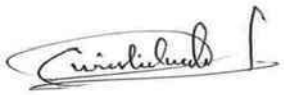
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 22, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 24, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

1-21-3

Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810229-2763

MICHIGAN 190

TestAmerica

TestAmerica Laboratories, Inc.

Regulatory program: DW NPDES RCRA Other

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				of COCs
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac/ NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-188S_022221	2/22/21	1515		6						6					N	G	X	X	X	X	X	X	X	3 vocs for 8260B 3 vocs for 8260B SIM

240-144817 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: Kristoffer Spera	Arcadis	2/22/21 1740	Received by: Novi cold storage	Arcadis	2/22/21 1740
Relinquished by: Julia McClafferty	Arcadis	2/23/2021	Received by: Amanda Battershell	ETA	2/23/21 10:04
Relinquished by: Amanda Battershell	ETA	2/23/21 10:47	Received in Laboratory by:	TA	2-24-21 800

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03/10/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144817-1
Date Collected: 02/22/21 00:00
Matrix: Water
Date Received: 02/24/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 15:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 15:07	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 15:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 15:07	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 15:07	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 15:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*03/02/21 15:07*	*1*
4-Bromofluorobenzene (Surr)	*78*		*47 - 134*		*03/02/21 15:07*	*1*
Toluene-d8 (Surr)	*88*		*69 - 122*		*03/02/21 15:07*	*1*
Dibromofluoromethane (Surr)	*112*		*78 - 129*		*03/02/21 15:07*	*1*

Client Sample ID: MW-188S_022221
Lab Sample ID: 240-144817-2
Date Collected: 02/22/21 15:15
Matrix: Water
Date Received: 02/24/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 18:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*70 - 133*		*03/01/21 18:29*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 15:29	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 15:29	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 15:29	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 15:29	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 15:29	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 15:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*03/02/21 15:29*	*1*
4-Bromofluorobenzene (Surr)	*76*		*47 - 134*		*03/02/21 15:29*	*1*
Toluene-d8 (Surr)	*87*		*69 - 122*		*03/02/21 15:29*	*1*
Dibromofluoromethane (Surr)	*112*		*78 - 129*		*03/02/21 15:29*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144669-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/5/2021 2:33:16 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144669-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144669-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144669-1

Comments
No additional comments.

Receipt
The samples were received on 2/19/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.4º C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) associated with batch 240-474473 recovered above the upper control limit for Vinyl Chloride. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported: TRIP BLANK (240-144669-1), MW-189_021721 (240-144669-2), MW-189S_021721 (240-144669-3) and (CCVIS 240-474473/3).

Method 8260B: The matrix spike/matrix spike duplicate (MS/MSD) for samples TRIP BLANK (240-144669-1), MW-189_021721 (240-144669-2) and MW-189S_021721 (240-144669-3) was not reported, because the analyte list for these samples did not match the analyte list for the MS/MSD parent sample.

Method 8260B SIM: The following volatiles sample was diluted due to foaming at the time of purging during the original sample analysis: MW-189S_021721 (240-144669-3). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144669-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144669-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144669-1	TRIP BLANK	Water	02/17/21 00:00	02/19/21 08:00	
240-144669-2	MW-189_021721	Water	02/17/21 14:45	02/19/21 08:00	
240-144669-3	MW-189S_021721	Water	02/17/21 15:50	02/19/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144669-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144669-1

No Detections.

Client Sample ID: MW-189_021721 — Lab Sample ID: 240-144669-2

No Detections.

Client Sample ID: MW-189S_021721 — Lab Sample ID: 240-144669-3

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144669-1

Client Sample ID: TRIP BLANK
Date Collected: 02/17/21 00:00
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144669-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 20:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 20:06	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 20:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 20:06	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 20:06	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 20:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*02/25/21 20:06*	*1*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*		*02/25/21 20:06*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*02/25/21 20:06*	*1*
Dibromofluoromethane (Surr)	*100*		*78 - 129*		*02/25/21 20:06*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144669-1

Client Sample ID: MW-189_021721
Date Collected: 02/17/21 14:45
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144669-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 21:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*		*02/25/21 21:58*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 20:31	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 20:31	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 20:31	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 20:31	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 20:31	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 20:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*02/25/21 20:31*	*1*
4-Bromofluorobenzene (Surr)	*102*		*47 - 134*		*02/25/21 20:31*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*02/25/21 20:31*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*02/25/21 20:31*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144669-1

Client Sample ID: MW-189S_021721
Date Collected: 02/17/21 15:50
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144669-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	4.0	U	4.0	1.7	ug/L			02/25/21 22:23	2

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/25/21 22:23*	*2*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 20:56	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 20:56	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 20:56	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 20:56	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 20:56	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 20:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*75 - 130*		*02/25/21 20:56*	*1*
4-Bromofluorobenzene (Surr)	*104*		*47 - 134*		*02/25/21 20:56*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*02/25/21 20:56*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*02/25/21 20:56*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144669-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144669-1	TRIP BLANK	101	103	92	100
240-144669-2	MW-189_021721	100	102	92	98
240-144669-3	MW-189S_021721	102	104	93	103
LCS 240-474473/5	Lab Control Sample	91	102	94	92
MB 240-474473/8	Method Blank	99	102	92	104

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144568-J-3 MS	Matrix Spike	79
240-144568-J-3 MSD	Matrix Spike Duplicate	83
240-144669-2	MW-189_021721	79
240-144669-3	MW-189S_021721	80
LCS 240-474490/4	Lab Control Sample	79
MB 240-474490/5	Method Blank	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474473/8
Matrix: Water
Analysis Batch: 474473

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 12:43	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 12:43	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 12:43	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 12:43	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 12:43	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 12:43	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*75 - 130*		*02/25/21 12:43*	*1*
4-Bromofluorobenzene (Surr)	*102*		*47 - 134*		*02/25/21 12:43*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*02/25/21 12:43*	*1*
Dibromofluoromethane (Surr)	*104*		*78 - 129*		*02/25/21 12:43*	*1*

Lab Sample ID: LCS 240-474473/5
Matrix: Water
Analysis Batch: 474473

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	20.0	19.7		ug/L		98	73 - 129
cis-1,2-Dichloroethene	20.0	19.9		ug/L		100	75 - 124
Tetrachloroethene	20.0	19.6		ug/L		98	70 - 125
trans-1,2-Dichloroethene	20.0	19.2		ug/L		96	74 - 130
Trichloroethene	20.0	18.6		ug/L		93	71 - 121
Vinyl chloride	20.0	23.1		ug/L		116	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*91*		*75 - 130*
4-Bromofluorobenzene (Surr)	*102*		*47 - 134*
Toluene-d8 (Surr)	*94*		*69 - 122*
Dibromofluoromethane (Surr)	*92*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474490/5
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 12:43	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/25/21 12:43*	*1*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-474490/4
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.7		ug/L		107	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*

Lab Sample ID: 240-144568-J-3 MS
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	10.2		ug/L		102	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*

Lab Sample ID: 240-144568-J-3 MSD
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.2		ug/L		102	46 - 170	0	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144669-1

GC/MS VOA

Analysis Batch: 474473

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144669-1	TRIP BLANK	Total/NA	Water	8260B	
240-144669-2	MW-189_021721	Total/NA	Water	8260B	
240-144669-3	MW-189S_021721	Total/NA	Water	8260B	
MB 240-474473/8	Method Blank	Total/NA	Water	8260B	
LCS 240-474473/5	Lab Control Sample	Total/NA	Water	8260B	

Analysis Batch: 474490

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144669-2	MW-189_021721	Total/NA	Water	8260B SIM	
240-144669-3	MW-189S_021721	Total/NA	Water	8260B SIM	
MB 240-474490/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474490/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144568-J-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144568-J-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144669-1

Client Sample ID: TRIP BLANK
Date Collected: 02/17/21 00:00
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144669-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474473	02/25/21 20:06	HMB	TAL CAN

Client Sample ID: MW-189_021721
Date Collected: 02/17/21 14:45
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144669-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474473	02/25/21 20:31	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		1	474490	02/25/21 21:58	SAM	TAL CAN

Client Sample ID: MW-189S_021721
Date Collected: 02/17/21 15:50
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144669-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474473	02/25/21 20:56	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		2	474490	02/25/21 22:23	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144669-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

MICHIGAN 190 TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Emma Witherspoon		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below: 10 day; 3 weeks; 2 weeks; 1 week; 2 days; 1 day

Analyses

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 trip blank
MW-189_021721	2/17/21	1445		6						6					N	G	X	X	X	X	X	X	X	3 vocs for 8260B 3 vocs for 8260B SIM
MW-189S_021721	2/17/21	1550		6						6					N	G	X	X	X	X	X	X	X	↓

240-144669 Chain of Custody



Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
E Witherspoon	Arcadis	2/17/21 / 1630	Christin Ulm	Arcadis	2/17/21 / 1630
Christin Ulm	ARCADIS	2/17/21 / 1700	NOVI COLD STORAGE	ARCADIS	2/17/21 / 1700
Julia McClafferty	Arcadis	2/18/2021	Received in Laboratory by:	Company: TA	Date/Time: 2-19-21 800

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Amanda Battenfield ETA 2/18/21 11:38 Amanda Battenfield ETA 2/18/21 10:18

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 144669
Canton Facility

Client Arcadis Site Name

Cooler unpacked by:

Cooler Received on 2-19-21 Opened on 2-19-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.3 °C Corrected Cooler Temp. 1.4 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 — Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? — Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? — Yes No
   -Were tamper/custody seals intact and uncompromised? — Yes No NA
3. Shippers' packing slip attached to the cooler(s)? — Yes No
4. Did custody papers accompany the sample(s)? — Yes No
5. Were the custody papers relinquished & signed in the appropriate place? — Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? — Yes No
7. Did all bottles arrive in good condition (Unbroken)? — Yes No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? — Yes No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? — Yes No
11. Sufficient quantity received to perform indicated analyses? — Yes No
12. Are these work share samples and all listed on the COC? — Yes No
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? — Yes No NA pH Strip Lot# HC907861
14. Were VOAs on the COC? — Yes No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. — Yes No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ____ — Yes No
17. Was a LL Hg or Me Hg trip blank present? ____ — Yes No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT



March 05, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144669-1
Sample date: 2021-02-17
Report received by CADENA: 2021-03-05
Initial Data Verification completed by CADENA: 2021-03-05
Number of Samples:3
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch MS/MSD issues as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

GCMS VOC QC batch CCV response outliers as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144669-1

		Sample Name:	TRIP BLANK				MW-189_021721				MW-189S_021721			
		Lab Sample ID:	2401446691				2401446692				2401446693			
		Sample Date:	2/17/2021				2/17/2021				2/17/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC													
OSW-8260B													
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim													
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	4.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

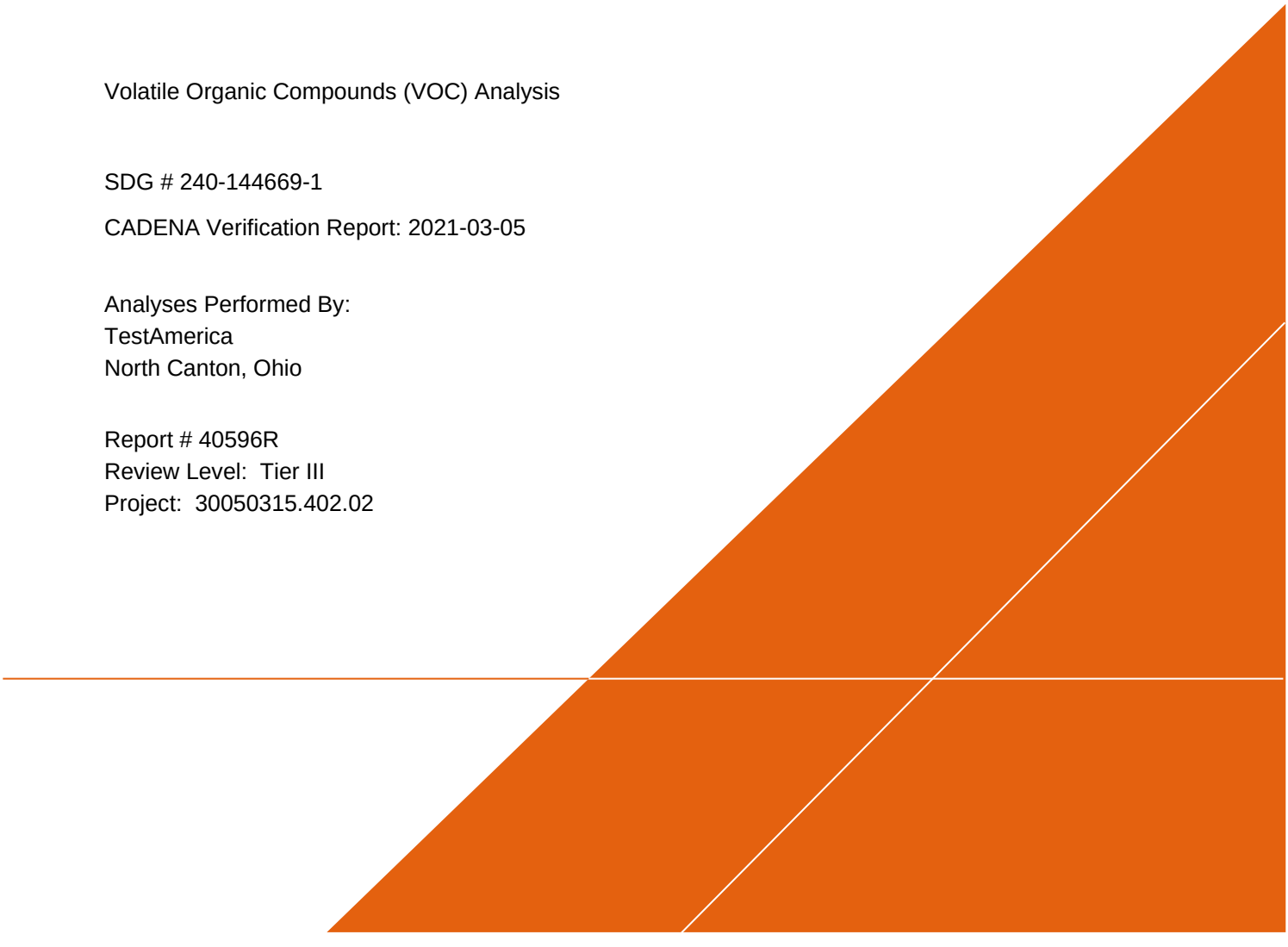
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144669-1

CADENA Verification Report: 2021-03-05

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40596R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144669-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144669-1	Water	02/17/2021		X	
MW-189_021721	240-144669-2	Water	02/17/2021		X	X
MW-189S_021721	240-144669-3	Water	02/17/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial/Continuing	Compound	Criteria
TRIP BLANK MW-189_021721 MW-189S_021721	CCV %D	Vinyl Chloride	+27.0%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R

Initial/Continuing	Criteria	Sample Result	Qualification
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1] RRF of 0.01 only applies to compounds which are typically poor responding compounds (i.e., ketones, 1,4-dioxane, etc.)

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

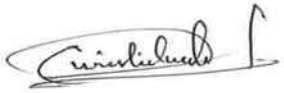
%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 17, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 18, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190 TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Emma Witherspoon		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day

Analyses

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 trip blank
MW-189_021721	2/17/21	1445		6						6					N	G	X	X	X	X	X	X	X	3 vcas for 8260B 3 vcas for 8260B SIM
MW-189S_021721	2/17/21	1550		6						6					N	G	X	X	X	X	X	X	X	↓

240-144669 Chain of Custody

Possible Hazard Identification: Non-Hazard, Flammable, Skin Irritant, Poison B, Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client, Disposal By Lab, Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
E Witherspoon	Arcadis	2/17/21 / 1630	Christin Ulm	Arcadis	2/17/21 / 1630
Christin Ulm	ARCADIS	2/17/21 / 1700	NOVI COLD STORAGE	ARCADIS	2/17/21 / 1700
Julia McClafferty	Arcadis	2/18/2021	Received in Laboratory by:	Company: TA	Date/Time: 2-19-21 800
Amanda Battenhof	ETA	2/18/21 11:38	Amanda Battenhof	ETA	2/18/21 10:18

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03/05/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144669-1
Date Collected: 02/17/21 00:00
Matrix: Water
Date Received: 02/19/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 20:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 20:06	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 20:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 20:06	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 20:06	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 20:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*02/25/21 20:06*	*1*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*		*02/25/21 20:06*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*02/25/21 20:06*	*1*
Dibromofluoromethane (Surr)	*100*		*78 - 129*		*02/25/21 20:06*	*1*

Client Sample ID: MW-189_021721
Lab Sample ID: 240-144669-2
Date Collected: 02/17/21 14:45
Matrix: Water
Date Received: 02/19/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 21:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*		*02/25/21 21:58*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 20:31	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 20:31	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 20:31	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 20:31	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 20:31	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 20:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*02/25/21 20:31*	*1*
4-Bromofluorobenzene (Surr)	*102*		*47 - 134*		*02/25/21 20:31*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*02/25/21 20:31*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*02/25/21 20:31*	*1*

Client Sample ID: MW-189S_021721
Lab Sample ID: 240-144669-3
Date Collected: 02/17/21 15:50
Matrix: Water
Date Received: 02/19/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	4.0	U	4.0	1.7	ug/L			02/25/21 22:23	2

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/25/21 22:23*	*2*

Client Sample ID: MW-189S_021721
Lab Sample ID: 240-144669-3
Date Collected: 02/17/21 15:50
Matrix: Water
Date Received: 02/19/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 20:56	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 20:56	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 20:56	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 20:56	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 20:56	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 20:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*75 - 130*		*02/25/21 20:56*	*1*
4-Bromofluorobenzene (Surr)	*104*		*47 - 134*		*02/25/21 20:56*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*02/25/21 20:56*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*02/25/21 20:56*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144920-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/11/2021 4:44:48 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144920-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144920-1

Job ID: 240-144920-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144920-1

Comments
No additional comments.

Receipt
The samples were received on 2/25/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.7º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144920-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144920-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144920-1	TRIP BLANK	Water	02/23/21 00:00	02/25/21 08:00	
240-144920-2	MW-190S_022321	Water	02/23/21 12:26	02/25/21 08:00	
240-144920-3	MW-190_022321	Water	02/23/21 13:56	02/25/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144920-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144920-1

No Detections.

Client Sample ID: MW-190S_022321 — Lab Sample ID: 240-144920-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	0.53	J	1.0	0.16	ug/L	1		8260B	Total/NA

Client Sample ID: MW-190_022321 — Lab Sample ID: 240-144920-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	1.1		1.0	0.16	ug/L	1		8260B	Total/NA
Vinyl chloride	0.34	J	1.0	0.20	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144920-1

Client Sample ID: TRIP BLANK
Date Collected: 02/23/21 00:00
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144920-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 15:55	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 15:55	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 15:55	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 15:55	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 15:55	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 15:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*75 - 130*		*03/02/21 15:55*	*1*
4-Bromofluorobenzene (Surr)	*70*		*47 - 134*		*03/02/21 15:55*	*1*
Toluene-d8 (Surr)	*79*		*69 - 122*		*03/02/21 15:55*	*1*
Dibromofluoromethane (Surr)	*111*		*78 - 129*		*03/02/21 15:55*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144920-1

Client Sample ID: MW-190S_022321
Date Collected: 02/23/21 12:26
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144920-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 19:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*70 - 133*		*03/02/21 19:31*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 17:55	1
cis-1,2-Dichloroethene	**0.53**	**J**	1.0	0.16	ug/L			03/02/21 17:55	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 17:55	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 17:55	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 17:55	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 17:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*75 - 130*		*03/02/21 17:55*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*03/02/21 17:55*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*03/02/21 17:55*	*1*
Dibromofluoromethane (Surr)	*107*		*78 - 129*		*03/02/21 17:55*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144920-1

Client Sample ID: MW-190_022321
Date Collected: 02/23/21 13:56
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144920-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 19:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 133*		*03/02/21 19:56*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 14:58	1
cis-1,2-Dichloroethene	**1.1**		1.0	0.16	ug/L			03/03/21 14:58	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 14:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 14:58	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 14:58	1
Vinyl chloride	**0.34**	**J**	1.0	0.20	ug/L			03/03/21 14:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*109*		*75 - 130*		*03/03/21 14:58*	*1*
4-Bromofluorobenzene (Surr)	*58*		*47 - 134*		*03/03/21 14:58*	*1*
Toluene-d8 (Surr)	*78*		*69 - 122*		*03/03/21 14:58*	*1*
Dibromofluoromethane (Surr)	*115*		*78 - 129*		*03/03/21 14:58*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144920-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144917-B-2 MS	Matrix Spike	89	90	90	91
240-144917-C-2 MSD	Matrix Spike Duplicate	88	90	102	89
240-144920-1	TRIP BLANK	108	70	79	111
240-144920-2	MW-190S_022321	106	65	93	107
240-144920-3	MW-190_022321	109	58	78	115
240-145090-C-1 MS	Matrix Spike	90	89	100	92
240-145090-D-1 MSD	Matrix Spike Duplicate	96	91	90	96
LCS 240-475070/4	Lab Control Sample	91	92	91	94
LCS 240-475282/4	Lab Control Sample	86	103	87	87
MB 240-475070/7	Method Blank	107	77	81	108
MB 240-475282/7	Method Blank	108	59	73	109

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144920-2	MW-190S_022321	91
240-144920-3	MW-190_022321	94
240-145076-O-2 MS	Matrix Spike	94
240-145076-O-2 MSD	Matrix Spike Duplicate	91
LCS 240-475052/4	Lab Control Sample	88
MB 240-475052/5	Method Blank	87

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475070/7
Matrix: Water
Analysis Batch: 475070

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 14:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 14:44	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 14:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 14:44	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 14:44	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 14:44	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*107*		*75 - 130*		*03/02/21 14:44*	*1*
4-Bromofluorobenzene (Surr)	*77*		*47 - 134*		*03/02/21 14:44*	*1*
Toluene-d8 (Surr)	*81*		*69 - 122*		*03/02/21 14:44*	*1*
Dibromofluoromethane (Surr)	*108*		*78 - 129*		*03/02/21 14:44*	*1*

Lab Sample ID: LCS 240-475070/4
Matrix: Water
Analysis Batch: 475070

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	11.0		ug/L		110	73 - 129
cis-1,2-Dichloroethene	10.0	9.24		ug/L		92	75 - 124
Tetrachloroethene	10.0	11.3		ug/L		113	70 - 125
trans-1,2-Dichloroethene	10.0	11.8		ug/L		118	74 - 130
Trichloroethene	10.0	9.62		ug/L		96	71 - 121
Vinyl chloride	10.0	10.8		ug/L		108	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*91*		*75 - 130*
4-Bromofluorobenzene (Surr)	*92*		*47 - 134*
Toluene-d8 (Surr)	*91*		*69 - 122*
Dibromofluoromethane (Surr)	*94*		*78 - 129*

Lab Sample ID: 240-144917-B-2 MS
Matrix: Water
Analysis Batch: 475070

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	11.2		ug/L		112	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	9.43		ug/L		94	68 - 121
Tetrachloroethene	1.0	U	10.0	12.3		ug/L		123	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	11.8		ug/L		118	69 - 126
Trichloroethene	1.0	U	10.0	9.86		ug/L		99	56 - 124
Vinyl chloride	1.0	U	10.0	10.7		ug/L		107	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*75 - 130*
4-Bromofluorobenzene (Surr)	*90*		*47 - 134*
Toluene-d8 (Surr)	*90*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144917-B-2 MS
Matrix: Water
Analysis Batch: 475070

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	91		78 - 129

Lab Sample ID: 240-144917-C-2 MSD
Matrix: Water
Analysis Batch: 475070

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	10.7		ug/L		107	64 - 132	4	35
cis-1,2-Dichloroethene	1.0	U	10.0	9.39		ug/L		94	68 - 121	0	35
Tetrachloroethene	1.0	U	10.0	11.7		ug/L		117	52 - 129	5	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.70		ug/L		97	69 - 126	19	35
Trichloroethene	1.0	U	10.0	10.7		ug/L		107	56 - 124	8	35
Vinyl chloride	1.0	U	10.0	11.2		ug/L		112	49 - 136	4	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	88		75 - 130
4-Bromofluorobenzene (Surr)	90		47 - 134
Toluene-d8 (Surr)	102		69 - 122
Dibromofluoromethane (Surr)	89		78 - 129

Lab Sample ID: MB 240-475282/7
Matrix: Water
Analysis Batch: 475282

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 14:34	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 14:34	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 14:34	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 14:34	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 14:34	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 14:34	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	108		75 - 130		03/03/21 14:34	1
4-Bromofluorobenzene (Surr)	59		47 - 134		03/03/21 14:34	1
Toluene-d8 (Surr)	73		69 - 122		03/03/21 14:34	1
Dibromofluoromethane (Surr)	109		78 - 129		03/03/21 14:34	1

Lab Sample ID: LCS 240-475282/4
Matrix: Water
Analysis Batch: 475282

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.97		ug/L		100	73 - 129
cis-1,2-Dichloroethene	10.0	8.42		ug/L		84	75 - 124
Tetrachloroethene	10.0	11.3		ug/L		113	70 - 125
trans-1,2-Dichloroethene	10.0	8.77		ug/L		88	74 - 130
Trichloroethene	10.0	10.1		ug/L		101	71 - 121

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-475282/4
Matrix: Water
Analysis Batch: 475282

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Vinyl chloride			10.0	9.57		ug/L		96	61 - 134		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*
Toluene-d8 (Surr)	*87*		*69 - 122*
Dibromofluoromethane (Surr)	*87*		*78 - 129*

Lab Sample ID: 240-145090-C-1 MS
Matrix: Water
Analysis Batch: 475282

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,1-Dichloroethene	2.5		10.0	11.9		ug/L		95	64 - 132		
cis-1,2-Dichloroethene	7.8		10.0	17.1		ug/L		93	68 - 121		
Tetrachloroethene	2.3	F1	10.0	15.5	F1	ug/L		132	52 - 129		
trans-1,2-Dichloroethene	1.0	U	10.0	10.2		ug/L		102	69 - 126		
Trichloroethene	3.4		10.0	12.8		ug/L		94	56 - 124		
Vinyl chloride	1.0	U	10.0	11.1		ug/L		111	49 - 136		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*75 - 130*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*
Toluene-d8 (Surr)	*100*		*69 - 122*
Dibromofluoromethane (Surr)	*92*		*78 - 129*

Lab Sample ID: 240-145090-D-1 MSD
Matrix: Water
Analysis Batch: 475282

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	2.5		10.0	14.1		ug/L		116	64 - 132	16	35
cis-1,2-Dichloroethene	7.8		10.0	17.4		ug/L		96	68 - 121	2	35
Tetrachloroethene	2.3	F1	10.0	14.0		ug/L		117	52 - 129	10	35
trans-1,2-Dichloroethene	1.0	U	10.0	12.0		ug/L		120	69 - 126	16	35
Trichloroethene	3.4		10.0	13.0		ug/L		97	56 - 124	2	35
Vinyl chloride	1.0	U	10.0	11.3		ug/L		113	49 - 136	2	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*96*		*75 - 130*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*
Toluene-d8 (Surr)	*90*		*69 - 122*
Dibromofluoromethane (Surr)	*96*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475052/5
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 12:26	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*70 - 133*		*03/02/21 12:26*	*1*

Lab Sample ID: LCS 240-475052/4
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	9.00		ug/L		90	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 133*

Lab Sample ID: 240-145076-O-2 MS
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	9.73		ug/L		97	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 133*

Lab Sample ID: 240-145076-O-2 MSD
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.82		ug/L		98	46 - 170	1	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*91*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144920-1

GC/MS VOA

Analysis Batch: 475052

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144920-2	MW-190S_022321	Total/NA	Water	8260B SIM	
240-144920-3	MW-190_022321	Total/NA	Water	8260B SIM	
MB 240-475052/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-475052/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-145076-O-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-145076-O-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 475070

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144920-1	TRIP BLANK	Total/NA	Water	8260B	
240-144920-2	MW-190S_022321	Total/NA	Water	8260B	
MB 240-475070/7	Method Blank	Total/NA	Water	8260B	
LCS 240-475070/4	Lab Control Sample	Total/NA	Water	8260B	
240-144917-B-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144917-C-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 475282

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144920-3	MW-190_022321	Total/NA	Water	8260B	
MB 240-475282/7	Method Blank	Total/NA	Water	8260B	
LCS 240-475282/4	Lab Control Sample	Total/NA	Water	8260B	
240-145090-C-1 MS	Matrix Spike	Total/NA	Water	8260B	
240-145090-D-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144920-1

Client Sample ID: TRIP BLANK
Date Collected: 02/23/21 00:00
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144920-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475070	03/02/21 15:55	LRW	TAL CAN

Client Sample ID: MW-190S_022321
Date Collected: 02/23/21 12:26
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144920-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475070	03/02/21 17:55	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	475052	03/02/21 19:31	SAM	TAL CAN

Client Sample ID: MW-190_022321
Date Collected: 02/23/21 13:56
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144920-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475282	03/03/21 14:58	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	475052	03/02/21 19:56	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144920-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

MICHIGAN 190 — TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Gary Schafer	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn/Ac/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/23/21									1							X	X	X	X	X	X	X	Trip blank
MW-190S-022321	02/23/21	12:26		X						6					N	G	X	X	X	X	X	X	X	Method 8260B; 8260B SIM
MW-190-022321	02/23/21	13:56		X						6					N	G	X	X	X	X	X	X	X	Method 8260B; 8260B SIM

240-144920 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	02/23/21 18:20	Novi Cold Storage	Arcadis	02/23/21 18:20
Julia McClafferty	Arcadis	2/24/2021	Amanda Battershell	ETA	2/24/21 10:04
Amanda Battershell	ETA	2/24/21 1404	Received in Laboratory by:	Company: 2-25-21 800	Date/Time: ETA

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3/11/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 144920
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Ryan C

Cooler Received on 2-25-21 Opened on 2-25-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2.6 °C Corrected Cooler Temp. 2.7 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 59072 (Yes) No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT



March 11, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144920-1
Sample date: 2021-02-23
Report received by CADENA: 2021-03-11
Initial Data Verification completed by CADENA: 2021-03-11
Number of Samples:3
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch MS/MSD recovery outliers were not determined using a client sample so qualification was not required based on these sample-specific QC outliers.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144920-1

		Sample Name:	TRIP BLANK				MW-190S_022321				MW-190_022321			
		Lab Sample ID:	2401449201				2401449202				2401449203			
		Sample Date:	2/23/2021				2/23/2021				2/23/2021			
	Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC														
	OSW-8260B													
	1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	0.53	1.0	ug/l	J	1.1	1.0	ug/l	---
	Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	0.34	1.0	ug/l	J
	OSW-8260BBSim													
	1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

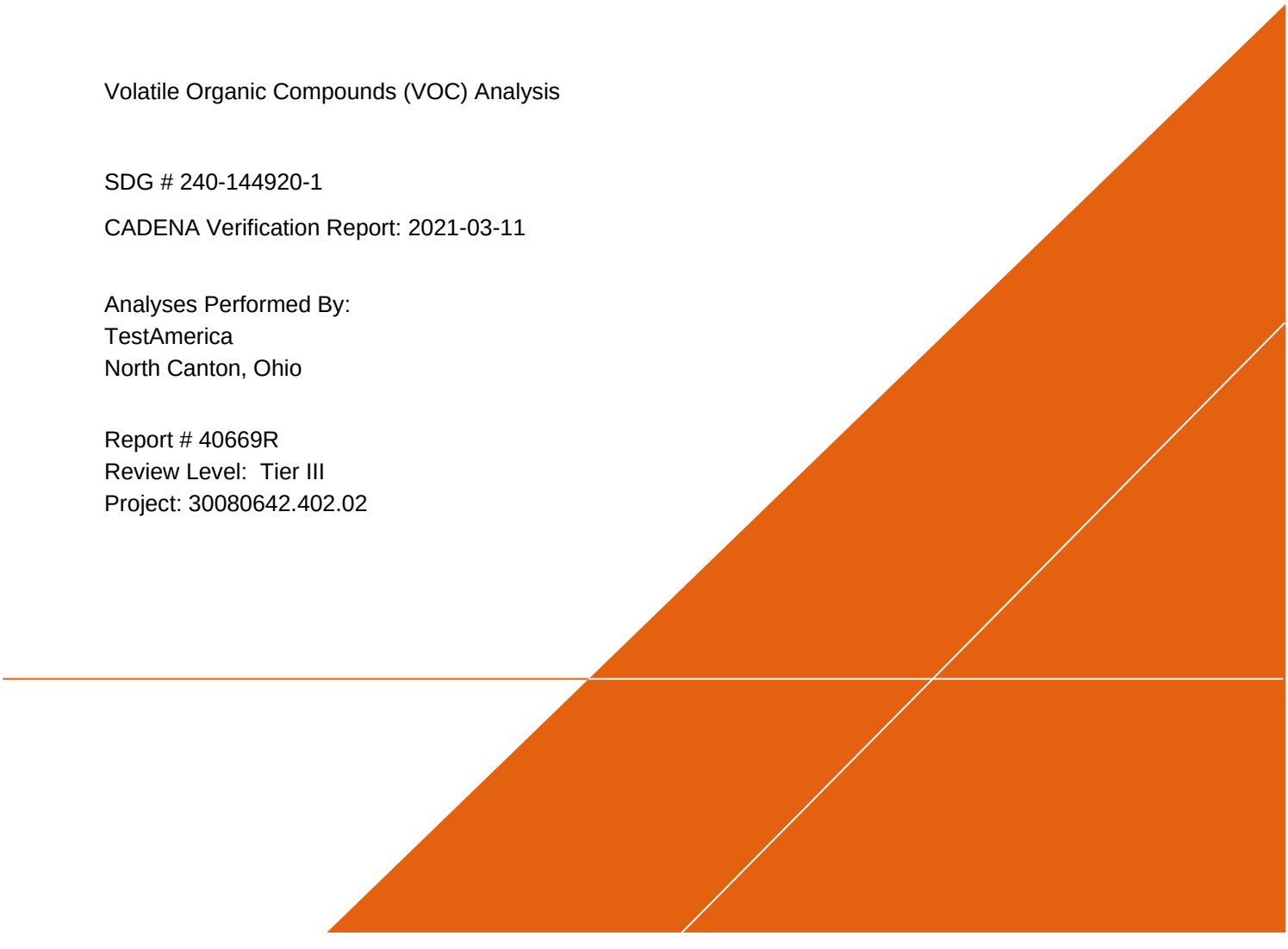
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144920-1

CADENA Verification Report: 2021-03-11

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40669R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144920-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144920-1	Water	02/23/2021		X	
MW-190S_022321	240-144920-2	Water	02/23/2021		X	X
MW-190_022321	240-144920-3	Water	02/23/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial/Continuing	Lab file ID	Compound	Criteria
MW-190_022321	CCV %D	UXR3292.D	Tetrachloroethene	+33.2%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action

Initial/Continuing	Criteria	Sample Result	Qualification
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1] RRF of 0.01 only applies to compounds which are typically poor responding compounds (i.e., ketones, 1,4-dioxane, etc.)

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

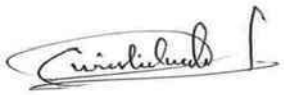
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 22, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 24, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190 — TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Gary Schafer	Analysis Turnaround Time	
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day	
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

COC No: 1 of 1 COCs

For lab use only: Walk-in client; Lab sampling; Job/SDG No:

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/23/21									1							X	X	X	X	X	X	X	1 trip blank
MW-190S-022321	02/23/21	12:26		X						6					N	G	X	X	X	X	X	X	X	Method 8260B; " 8260B SIM
MW-190-022321	02/23/21	13:56		X						6					N	G	X	X	X	X	X	X	X	Method 8260B; " 8260B SIM

240-144920 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	02/23/21 18:20	Novi Cold Storage	Arcadis	02/23/21 18:20
Julia McClafferty	Arcadis	2/24/2021	Amanda Battenhull	ETA	2/24/21 10:04
Amanda Battenhull	ETA	2/24/21 1404	Received in Laboratory by:	Company: 2-25-21 800	Date/Time: ETA

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Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144920-1

Date Collected: 02/23/21 00:00
Matrix: Water
Date Received: 02/25/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 15:55	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 15:55	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 15:55	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 15:55	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 15:55	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 15:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*75 - 130*		*03/02/21 15:55*	*1*
4-Bromofluorobenzene (Surr)	*70*		*47 - 134*		*03/02/21 15:55*	*1*
Toluene-d8 (Surr)	*79*		*69 - 122*		*03/02/21 15:55*	*1*
Dibromofluoromethane (Surr)	*111*		*78 - 129*		*03/02/21 15:55*	*1*

Client Sample ID: MW-190S_022321

Lab Sample ID: 240-144920-2

Date Collected: 02/23/21 12:26
Matrix: Water
Date Received: 02/25/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 19:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*70 - 133*		*03/02/21 19:31*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 17:55	1
cis-1,2-Dichloroethene	**0.53**	**J**	1.0	0.16	ug/L			03/02/21 17:55	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 17:55	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 17:55	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 17:55	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 17:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*75 - 130*		*03/02/21 17:55*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*03/02/21 17:55*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*03/02/21 17:55*	*1*
Dibromofluoromethane (Surr)	*107*		*78 - 129*		*03/02/21 17:55*	*1*

Client Sample ID: MW-190_022321

Lab Sample ID: 240-144920-3

Date Collected: 02/23/21 13:56
Matrix: Water
Date Received: 02/25/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 19:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 133*		*03/02/21 19:56*	*1*

Client Sample ID: MW-190_022321
Lab Sample ID: 240-144920-3
Date Collected: 02/23/21 13:56
Matrix: Water
Date Received: 02/25/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 14:58	1
cis-1,2-Dichloroethene	**1.1**		1.0	0.16	ug/L			03/03/21 14:58	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 14:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 14:58	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 14:58	1
Vinyl chloride	**0.34**	**J**	1.0	0.20	ug/L			03/03/21 14:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*109*		*75 - 130*		*03/03/21 14:58*	*1*
4-Bromofluorobenzene (Surr)	*58*		*47 - 134*		*03/03/21 14:58*	*1*
Toluene-d8 (Surr)	*78*		*69 - 122*		*03/03/21 14:58*	*1*
Dibromofluoromethane (Surr)	*115*		*78 - 129*		*03/03/21 14:58*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144911-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/11/2021 4:32:08 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144911-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144911-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144911-1

Comments
No additional comments.

Receipt
The samples were received on 2/25/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.7° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144911-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144911-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144911-1	TRIP BLANK	Water	02/23/21 00:00	02/25/21 08:00	
240-144911-2	MW-128S_022321	Water	02/23/21 16:06	02/25/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144911-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144911-1

No Detections.

Client Sample ID: MW-128S_022321 — Lab Sample ID: 240-144911-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144911-1

Client Sample ID: TRIP BLANK
Date Collected: 02/23/21 00:00
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144911-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 16:08	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 16:08	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 16:08	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 16:08	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 16:08	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 16:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*03/02/21 16:08*	*1*
4-Bromofluorobenzene (Surr)	*84*		*47 - 134*		*03/02/21 16:08*	*1*
Toluene-d8 (Surr)	*98*		*69 - 122*		*03/02/21 16:08*	*1*
Dibromofluoromethane (Surr)	*97*		*78 - 129*		*03/02/21 16:08*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144911-1

Client Sample ID: MW-128S_022321

Date Collected: 02/23/21 16:06
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144911-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 17:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 133*		*03/02/21 17:00*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 16:30	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 16:30	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 16:30	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 16:30	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 16:30	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 16:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*75 - 130*		*03/02/21 16:30*	*1*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*		*03/02/21 16:30*	*1*
Toluene-d8 (Surr)	*101*		*69 - 122*		*03/02/21 16:30*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*03/02/21 16:30*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144911-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144718-C-13 MS	Matrix Spike	97	95	99	99
240-144718-C-13 MSD	Matrix Spike Duplicate	97	89	97	99
240-144911-1	TRIP BLANK	101	84	98	97
240-144911-2	MW-128S_022321	106	89	101	103
LCS 240-475001/4	Lab Control Sample	92	88	92	97
MB 240-475001/6	Method Blank	100	85	95	99

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144911-2	MW-128S_022321	88
240-145076-O-2 MS	Matrix Spike	94
240-145076-O-2 MSD	Matrix Spike Duplicate	91
LCS 240-475052/4	Lab Control Sample	88
MB 240-475052/5	Method Blank	87

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475001/6
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 11:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 11:19	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 11:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 11:19	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 11:19	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 11:19	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*03/02/21 11:19*	*1*
4-Bromofluorobenzene (Surr)	*85*		*47 - 134*		*03/02/21 11:19*	*1*
Toluene-d8 (Surr)	*95*		*69 - 122*		*03/02/21 11:19*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*03/02/21 11:19*	*1*

Lab Sample ID: LCS 240-475001/4
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.92		ug/L		89	73 - 129
cis-1,2-Dichloroethene	10.0	9.98		ug/L		100	75 - 124
Tetrachloroethene	10.0	9.61		ug/L		96	70 - 125
trans-1,2-Dichloroethene	10.0	9.73		ug/L		97	74 - 130
Trichloroethene	10.0	9.44		ug/L		94	71 - 121
Vinyl chloride	10.0	9.30		ug/L		93	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*
Toluene-d8 (Surr)	*92*		*69 - 122*
Dibromofluoromethane (Surr)	*97*		*78 - 129*

Lab Sample ID: 240-144718-C-13 MS
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25	U	250	217		ug/L		87	64 - 132
cis-1,2-Dichloroethene	25	U	250	230		ug/L		92	68 - 121
Tetrachloroethene	5.3	J	250	231		ug/L		90	52 - 129
trans-1,2-Dichloroethene	25	U	250	224		ug/L		90	69 - 126
Trichloroethene	510		250	655		ug/L		57	56 - 124
Vinyl chloride	25	U	250	208		ug/L		83	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*99*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144718-C-13 MS
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*99*		*78 - 129*

Lab Sample ID: 240-144718-C-13 MSD
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	25	U	250	236		ug/L		94	64 - 132	8	35
cis-1,2-Dichloroethene	25	U	250	241		ug/L		97	68 - 121	5	35
Tetrachloroethene	5.3	J	250	251		ug/L		98	52 - 129	9	35
trans-1,2-Dichloroethene	25	U	250	236		ug/L		94	69 - 126	5	35
Trichloroethene	510		250	728		ug/L		86	56 - 124	11	35
Vinyl chloride	25	U	250	256		ug/L		103	49 - 136	21	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*
Toluene-d8 (Surr)	*97*		*69 - 122*
Dibromofluoromethane (Surr)	*99*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475052/5
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 12:26	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*70 - 133*		*03/02/21 12:26*	*1*

Lab Sample ID: LCS 240-475052/4
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.00		ug/L		90	80 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 133*

Lab Sample ID: 240-145076-O-2 MS
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	9.73		ug/L		97	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 133*

Lab Sample ID: 240-145076-O-2 MSD
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.82		ug/L		98	46 - 170	1	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*91*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144911-1

GC/MS VOA

Analysis Batch: 475001

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144911-1	TRIP BLANK	Total/NA	Water	8260B	
240-144911-2	MW-128S_022321	Total/NA	Water	8260B	
MB 240-475001/6	Method Blank	Total/NA	Water	8260B	
LCS 240-475001/4	Lab Control Sample	Total/NA	Water	8260B	
240-144718-C-13 MS	Matrix Spike	Total/NA	Water	8260B	
240-144718-C-13 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 475052

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144911-2	MW-128S_022321	Total/NA	Water	8260B SIM	
MB 240-475052/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-475052/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-145076-O-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-145076-O-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144911-1

Client Sample ID: TRIP BLANK
Date Collected: 02/23/21 00:00
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144911-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475001	03/02/21 16:08	LEE	TAL CAN

Client Sample ID: MW-128S_022321
Date Collected: 02/23/21 16:06
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144911-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475001	03/02/21 16:30	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	475052	03/02/21 17:00	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144911-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN

TestAmerica Laboratories, Inc.

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac / NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/23/21			X						1							X	X	X	X	X	X	X	1 trip blank
MW-1285-022321	02/23/21	16:06		X						6					N	G	X	X	X	X	X	X	X	Method 8260B in 8260B SIMS

240-144911 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ...

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For [ ] Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	02/23/21 18:01	Non-cold storage	Arcadis	02/23/21 18:01
Julia McClafferty	Arcadis	2/24/2021	Amanda Battershell	ETA	2/24/21 10:04
Amanda Battershell	ETA	2/24/21 1401	Received in Laboratory by:	TA	2-25-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative Login # : 144911
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Ryan C

Cooler Received on 2-25-21 Opened on 2-25-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2.6 °C Corrected Cooler Temp. 2.7 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes) No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes) No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes (No)
-Were tamper/custody seals intact and uncompromised?	(Yes) No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes (No)
4. Did custody papers accompany the sample(s)?	(Yes) No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes) No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?	
10. Were correct bottle(s) used for the test(s) indicated?	(Yes) No
11. Sufficient quantity received to perform indicated analyses?	(Yes) No
12. Are these work share samples and all listed on the COC?	Yes (No)
If yes, Questions 13-17 have been checked at the originating laboratory.	
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC?	(Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 59072	(Yes) No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page | Samples processed by:

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

March 11, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144911-1
Sample date: 2021-02-23
Report received by CADENA: 2021-03-11
Initial Data Verification completed by CADENA: 2021-03-11
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144911-1

		Sample Name:	TRIP BLANK				MW-128S_022321			
		Lab Sample ID:	2401449111				2401449112			
		Sample Date:	2/23/2021				2/23/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

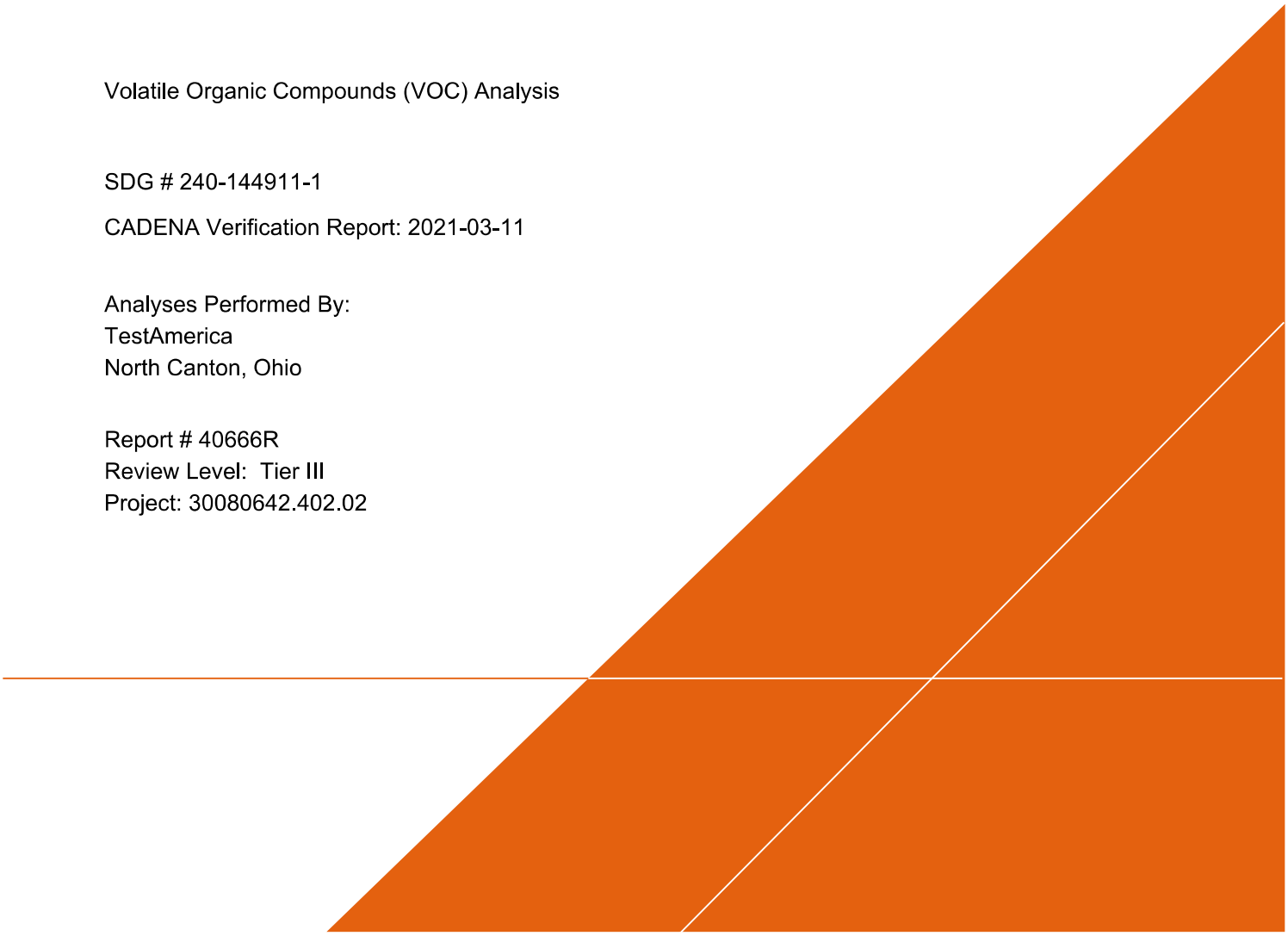
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144911-1

CADENA Verification Report: 2021-03-11

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40666R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144911-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144911-1	Water	02/23/2021		X	
MW-128S_022321	240-144911-2	Water	02/23/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 23, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 24, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day (10 day)		Walk-in client:
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac / NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM					Sample Specific Notes / Special Instructions:
TRIP BLANK	02/23/21			X						1							X	X	X	X	X	X	X					1 trip blank
MW-1285-022321	02/23/21	16:06		X						6					N	G	X	X	X	X	X	X	X					Method 8260B w 8260B sims

240-144911 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ...

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	02/23/21 18:01	Non-cold Storage	Arcadis	02/23/21 18:01
Julia McClafferty	Arcadis	2/24/2021	Amanda Battenhall	ETA	2/24/21 10:04
Amanda Battenhall	ETA	2/24/21 1401	Received in Laboratory by:	TA	2-25-21 800

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144911-1
Date Collected: 02/23/21 00:00
Matrix: Water
Date Received: 02/25/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 16:08	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 16:08	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 16:08	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 16:08	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 16:08	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 16:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*03/02/21 16:08*	*1*
4-Bromofluorobenzene (Surr)	*84*		*47 - 134*		*03/02/21 16:08*	*1*
Toluene-d8 (Surr)	*98*		*69 - 122*		*03/02/21 16:08*	*1*
Dibromofluoromethane (Surr)	*97*		*78 - 129*		*03/02/21 16:08*	*1*

Client Sample ID: MW-128S_022321
Lab Sample ID: 240-144911-2
Date Collected: 02/23/21 16:06
Matrix: Water
Date Received: 02/25/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 17:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 133*		*03/02/21 17:00*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 16:30	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 16:30	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 16:30	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 16:30	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 16:30	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 16:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*75 - 130*		*03/02/21 16:30*	*1*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*		*03/02/21 16:30*	*1*
Toluene-d8 (Surr)	*101*		*69 - 122*		*03/02/21 16:30*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*03/02/21 16:30*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144562-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
2/28/2021 1:58:55 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
S1-	Surrogate recovery exceeds control limits, low biased.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144562-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144562-1

Comments
No additional comments.

Receipt
The samples were received on 2/17/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.5° C.

GC/MS VOA
Method 8260B: The laboratory control sample (LCS) for analytical batch 240-474305 recovered outside control limits for the following analyte: Tetrachloroethane. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data has been reported: TRIP BLANK (240-144562-1) and (LCS 240-474305/4).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144562-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144562-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144562-1	TRIP BLANK	Water	02/15/21 00:00	02/17/21 08:00	
240-144562-2	MW-146S_021521	Water	02/15/21 14:30	02/17/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144562-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144562-1

No Detections.

Client Sample ID: MW-146S_021521 — Lab Sample ID: 240-144562-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144562-1

Client Sample ID: TRIP BLANK
Date Collected: 02/15/21 00:00
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144562-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 20:42	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 20:42	1
Tetrachloroethene	1.0	U *+	1.0	0.15	ug/L			02/24/21 20:42	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 20:42	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 20:42	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 20:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*75 - 130*		*02/24/21 20:42*	*1*
4-Bromofluorobenzene (Surr)	*60*		*47 - 134*		*02/24/21 20:42*	*1*
Toluene-d8 (Surr)	*81*		*69 - 122*		*02/24/21 20:42*	*1*
Dibromofluoromethane (Surr)	*111*		*78 - 129*		*02/24/21 20:42*	*1*

Client Sample ID: MW-146S_021521
Date Collected: 02/15/21 14:30
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144562-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 17:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/22/21 17:01*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 18:11	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 18:11	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 18:11	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 18:11	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 18:11	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 18:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*		*02/25/21 18:11*	*1*
4-Bromofluorobenzene (Surr)	*99*		*47 - 134*		*02/25/21 18:11*	*1*
Toluene-d8 (Surr)	*94*		*69 - 122*		*02/25/21 18:11*	*1*
Dibromofluoromethane (Surr)	*85*		*78 - 129*		*02/25/21 18:11*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144562-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144562-1	TRIP BLANK	89	60	81	111
240-144562-2	MW-146S_021521	84	99	94	85
240-144568-B-3 MS	Matrix Spike	71 S1-	86	92	87
240-144568-E-3 MSD	Matrix Spike Duplicate	69 S1-	91	93	88
240-144661-D-2 MS	Matrix Spike	84	99	93	86
240-144661-E-2 MSD	Matrix Spike Duplicate	84	99	94	87
LCS 240-474305/4	Lab Control Sample	88	87	89	91
LCS 240-474500/4	Lab Control Sample	85	101	93	86
MB 240-474305/7	Method Blank	98	67	84	103
MB 240-474500/7	Method Blank	86	98	94	86

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144518-M-2 MS	Matrix Spike	84
240-144518-M-2 MSD	Matrix Spike Duplicate	84
240-144562-2	MW-146S_021521	83
LCS 240-473970/4	Lab Control Sample	80
MB 240-473970/5	Method Blank	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474305/7
Matrix: Water
Analysis Batch: 474305

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 14:13	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 14:13	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 14:13	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 14:13	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 14:13	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 14:13	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 130*		*02/24/21 14:13*	*1*
4-Bromofluorobenzene (Surr)	*67*		*47 - 134*		*02/24/21 14:13*	*1*
Toluene-d8 (Surr)	*84*		*69 - 122*		*02/24/21 14:13*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*02/24/21 14:13*	*1*

Lab Sample ID: LCS 240-474305/4
Matrix: Water
Analysis Batch: 474305

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.8		ug/L		108	73 - 129
cis-1,2-Dichloroethene	10.0	9.69		ug/L		97	75 - 124
Tetrachloroethene	10.0	12.6	*+	ug/L		126	70 - 125
trans-1,2-Dichloroethene	10.0	11.0		ug/L		110	74 - 130
Trichloroethene	10.0	10.3		ug/L		103	71 - 121
Vinyl chloride	10.0	9.04		ug/L		90	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 130*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*
Toluene-d8 (Surr)	*89*		*69 - 122*
Dibromofluoromethane (Surr)	*91*		*78 - 129*

Lab Sample ID: 240-144568-B-3 MS
Matrix: Water
Analysis Batch: 474305

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.41		ug/L		94	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	8.71		ug/L		87	68 - 121
Tetrachloroethene	1.0	U *+	10.0	11.6		ug/L		116	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.81		ug/L		98	69 - 126
Trichloroethene	1.0	U	10.0	9.03		ug/L		90	56 - 124
Vinyl chloride	1.0	U	10.0	8.44		ug/L		84	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*71*	*S1-*	*75 - 130*
4-Bromofluorobenzene (Surr)	*86*		*47 - 134*
Toluene-d8 (Surr)	*92*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144568-B-3 MS
Matrix: Water
Analysis Batch: 474305

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*87*		*78 - 129*

Lab Sample ID: 240-144568-E-3 MSD
Matrix: Water
Analysis Batch: 474305

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.22		ug/L		92	64 - 132	2	35
cis-1,2-Dichloroethene	1.0	U	10.0	8.56		ug/L		86	68 - 121	2	35
Tetrachloroethene	1.0	U *+	10.0	11.0		ug/L		110	52 - 129	6	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.16		ug/L		92	69 - 126	7	35
Trichloroethene	1.0	U	10.0	8.83		ug/L		88	56 - 124	2	35
Vinyl chloride	1.0	U	10.0	8.72		ug/L		87	49 - 136	3	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*69*	*S1-*	*75 - 130*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*88*		*78 - 129*

Lab Sample ID: MB 240-474500/7
Matrix: Water
Analysis Batch: 474500

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 14:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 14:52	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 14:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 14:52	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 14:52	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 14:52	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*		*02/25/21 14:52*	*1*
4-Bromofluorobenzene (Surr)	*98*		*47 - 134*		*02/25/21 14:52*	*1*
Toluene-d8 (Surr)	*94*		*69 - 122*		*02/25/21 14:52*	*1*
Dibromofluoromethane (Surr)	*86*		*78 - 129*		*02/25/21 14:52*	*1*

Lab Sample ID: LCS 240-474500/4
Matrix: Water
Analysis Batch: 474500

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.93		ug/L		89	73 - 129
cis-1,2-Dichloroethene	10.0	9.08		ug/L		91	75 - 124
Tetrachloroethene	10.0	9.68		ug/L		97	70 - 125
trans-1,2-Dichloroethene	10.0	9.29		ug/L		93	74 - 130
Trichloroethene	10.0	8.87		ug/L		89	71 - 121

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-474500/4
Matrix: Water
Analysis Batch: 474500

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Vinyl chloride			10.0	10.7		ug/L		107	61 - 134		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*75 - 130*
4-Bromofluorobenzene (Surr)	*101*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*86*		*78 - 129*

Lab Sample ID: 240-144661-D-2 MS
Matrix: Water
Analysis Batch: 474500

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
cis-1,2-Dichloroethene	1.0	U	10.0	8.81		ug/L		88	68 - 121		
Tetrachloroethene	1.0	U	10.0	8.35		ug/L		84	52 - 129		
trans-1,2-Dichloroethene	1.0	U	10.0	8.36		ug/L		84	69 - 126		
Trichloroethene	1.0	U	10.0	8.22		ug/L		82	56 - 124		
Vinyl chloride	20		10.0	30.2		ug/L		102	49 - 136		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*
4-Bromofluorobenzene (Surr)	*99*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*86*		*78 - 129*

Lab Sample ID: 240-144661-E-2 MSD
Matrix: Water
Analysis Batch: 474500

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
cis-1,2-Dichloroethene	1.0	U	10.0	8.80		ug/L		88	68 - 121	0	35
Tetrachloroethene	1.0	U	10.0	8.53		ug/L		85	52 - 129	2	35
trans-1,2-Dichloroethene	1.0	U	10.0	8.64		ug/L		86	69 - 126	3	35
Trichloroethene	1.0	U	10.0	8.36		ug/L		84	56 - 124	2	35
Vinyl chloride	20		10.0	29.8		ug/L		98	49 - 136	1	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*
4-Bromofluorobenzene (Surr)	*99*		*47 - 134*
Toluene-d8 (Surr)	*94*		*69 - 122*
Dibromofluoromethane (Surr)	*87*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473970/5
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 14:03	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/22/21 14:03*	*1*

Lab Sample ID: LCS 240-473970/4
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.3		ug/L		103	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*

Lab Sample ID: 240-144518-M-2 MS
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	10.3		ug/L		103	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*

Lab Sample ID: 240-144518-M-2 MSD
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.4		ug/L		104	46 - 170	1	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144562-1

GC/MS VOA

Analysis Batch: 473970

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144562-2	MW-146S_021521	Total/NA	Water	8260B SIM	
MB 240-473970/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-473970/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144518-M-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144518-M-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474305

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144562-1	TRIP BLANK	Total/NA	Water	8260B	
MB 240-474305/7	Method Blank	Total/NA	Water	8260B	
LCS 240-474305/4	Lab Control Sample	Total/NA	Water	8260B	
240-144568-B-3 MS	Matrix Spike	Total/NA	Water	8260B	
240-144568-E-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 474500

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144562-2	MW-146S_021521	Total/NA	Water	8260B	
MB 240-474500/7	Method Blank	Total/NA	Water	8260B	
LCS 240-474500/4	Lab Control Sample	Total/NA	Water	8260B	
240-144661-D-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144661-E-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144562-1

Client Sample ID: TRIP BLANK
Date Collected: 02/15/21 00:00
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144562-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474305	02/24/21 20:42	LRW	TAL CAN

Client Sample ID: MW-146S_021521
Date Collected: 02/15/21 14:30
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144562-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474500	02/25/21 18:11	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	473970	02/22/21 17:01	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144562-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

0-4/0.5

Chain of Custody Record

TestAmerica MICHIGAN 190

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	☐ DW ☐ NPDES ☐ RCRA ☐ Other	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500		Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377		Sampler Name: Emma Witherspoon	TAT if different from below: ☐ 3 weeks ☑ 10 day ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client
Phone: 248-994-2240		Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site		Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04					
PO # 30050315.402.04					

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-146S 021521	2/15/21	1430		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-144562 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
E Witherspoon	Arcadis	2/15/21 1700	Novi Cold Storage	Arcadis	2/15/21 1700
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	ARCADIS	2/16/21 1009	Amanda Battenfield	ETA	2/16/21 10:09
Relinquished by: Amanda Battenfield	Company: ETA	Date/Time: 2/16/21 1240	Received in Laboratory by:	Company: ETA	Date/Time: 2-17-21 800

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2/28/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 144562
Canton Facility

Client Arcadis Site Name

Cooler Received on 2-17-21 Opened on 2-17-21

Cooler unpacked by: MattSmith

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # 1 Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 0.4 °C Corrected Cooler Temp. 0.5 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	(Yes)	No
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No	(NA) pH Strip Lot# HC907861
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ____	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

February 28, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144562-1
Sample date: 2021-02-15
Report received by CADENA: 2021-02-28
Initial Data Verification completed by CADENA: 2021-02-28
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 474305 LCS recovery was outlying biased high for the following analyte: TETRACHLOROETHENE. Associated client sample results were non-detect so qualification was not required based on this high bias QC outlier.

GCMS VOC QC batch MS/MSD surrogate recovery outliers were not determined using a client sample so qualification was not required based on these sample-specific QC outliers.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144562-1

		Sample Name:	TRIP BLANK				MW-146S_021521			
		Lab Sample ID:	2401445621				2401445622			
		Sample Date:	2/15/2021				2/15/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

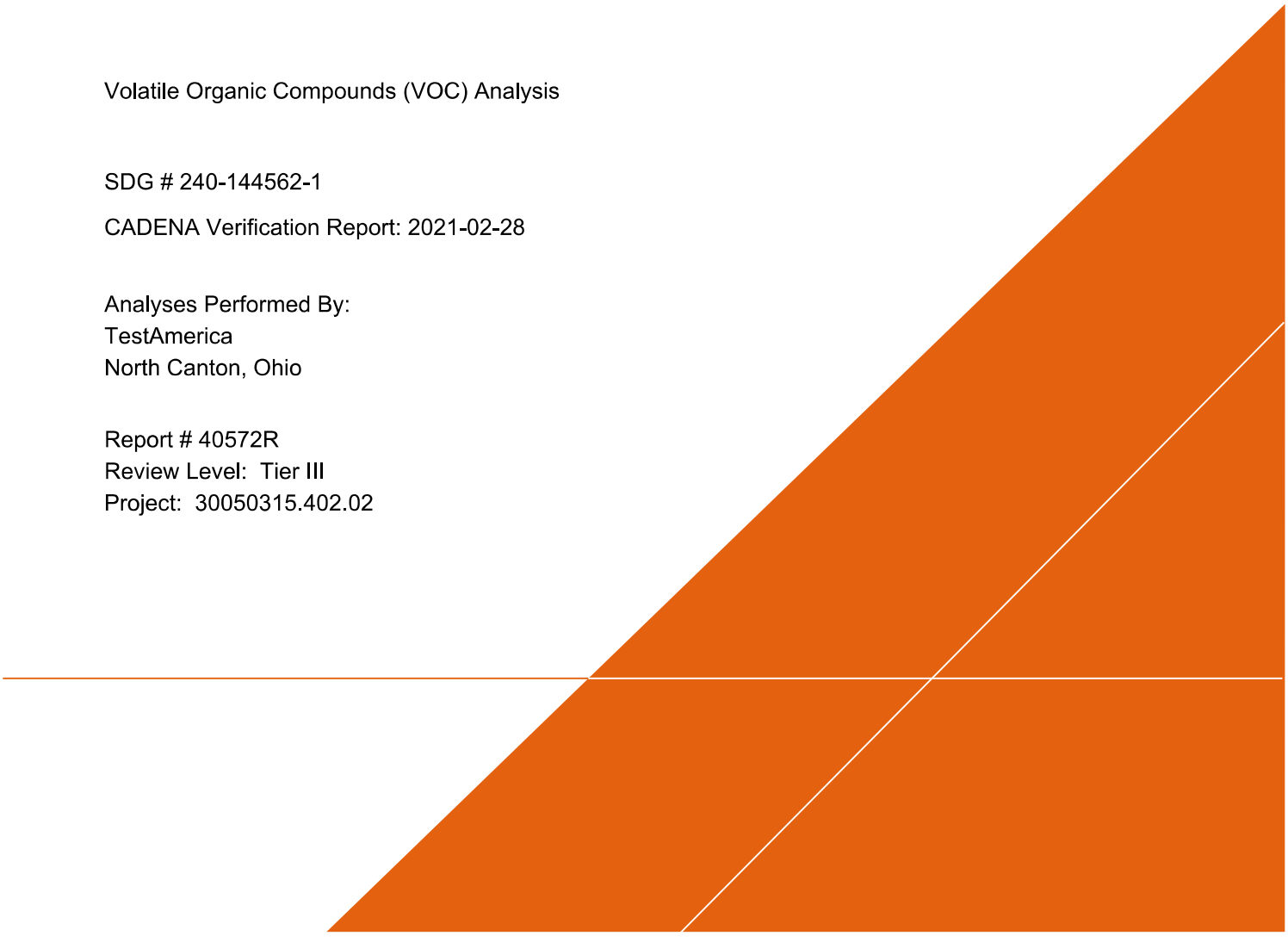
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144562-1

CADENA Verification Report: 2021-02-28

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40572R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144562-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144562-1	Water	02/15/2021		X	
MW-146S_021521	240-144562-2	Water	02/15/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial/Continuing	Lab file ID	Compound	Criteria
TRIP BLANK	CCV %D	UXR3152.D	Tetrachloroethene	+30.7%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action

Initial/Continuing	Criteria	Sample Result	Qualification
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1] RRF of 0.01 only applies to compounds which are typically poor responding compounds (i.e., ketones, 1,4-dioxane, etc.)

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 17, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

0-4/0.5

Chain of Custody Record

TestAmerica MICHIGAN 190

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-146S 021521	12/15/21	1430		6						6					N	G	X	X	X	X	X	X	X	3 vocs for 8260B 3 vocs for 8260B SIM

240-144562 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
E Witherspoon	Arcadis	2/15/21 1700	Novi Cold Storage	Arcadis	2/15/21 1700
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Chantye Uyl	ARCADIS	2/16/21 1009	Amanda Battershell	ETA	2/16/21 10:09
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
Amanda Battershell	ETA	2/16/21 1240	Mike	ETA	2-17-21 800

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02/28/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144562-1
Date Collected: 02/15/21 00:00
Matrix: Water
Date Received: 02/17/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 20:42	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 20:42	1
Tetrachloroethene	1.0	U *+	1.0	0.15	ug/L			02/24/21 20:42	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 20:42	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 20:42	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 20:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*75 - 130*		*02/24/21 20:42*	*1*
4-Bromofluorobenzene (Surr)	*60*		*47 - 134*		*02/24/21 20:42*	*1*
Toluene-d8 (Surr)	*81*		*69 - 122*		*02/24/21 20:42*	*1*
Dibromofluoromethane (Surr)	*111*		*78 - 129*		*02/24/21 20:42*	*1*

Client Sample ID: MW-146S_021521
Lab Sample ID: 240-144562-2
Date Collected: 02/15/21 14:30
Matrix: Water
Date Received: 02/17/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 17:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/22/21 17:01*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 18:11	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 18:11	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 18:11	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 18:11	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 18:11	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 18:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*		*02/25/21 18:11*	*1*
4-Bromofluorobenzene (Surr)	*99*		*47 - 134*		*02/25/21 18:11*	*1*
Toluene-d8 (Surr)	*94*		*69 - 122*		*02/25/21 18:11*	*1*
Dibromofluoromethane (Surr)	*85*		*78 - 129*		*02/25/21 18:11*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144503-1
Client Project/Site: Ford LTP - Off Site
Revision: 1

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/26/2021 9:37:06 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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Visit us at:
www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144503-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144503-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144503-1

Comments
No additional comments.

Revision
The report being provided is a revision of the original report sent on 2/24/2021. The report (revision 1) is being revised due to: Samples mislabeled during unpacking - revised to correct data..

Receipt
The samples were received on 2/13/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.6° C.

GC/MS VOA
Method 8260B: The following sample was analyzed outside of analytical holding time due to mis-labeled vial: TRIP BLANK (240-144503-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144503-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144503-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144503-1	TRIP BLANK	Water	02/11/21 00:00	02/13/21 08:00	
240-144503-2	MW-150S_021121	Water	02/11/21 15:15	02/13/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144503-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144503-1

No Detections.

Client Sample ID: MW-150S_021121 — Lab Sample ID: 240-144503-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	0.35	J	1.0	0.20	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144503-1

Client Sample ID: TRIP BLANK

Date Collected: 02/11/21 00:00
Date Received: 02/13/21 08:00

Lab Sample ID: 240-144503-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U H	1.0	0.19	ug/L			03/15/21 16:30	1
cis-1,2-Dichloroethene	1.0	U H	1.0	0.16	ug/L			03/15/21 16:30	1
Tetrachloroethene	1.0	U H	1.0	0.15	ug/L			03/15/21 16:30	1
trans-1,2-Dichloroethene	1.0	U H	1.0	0.19	ug/L			03/15/21 16:30	1
Trichloroethene	1.0	U H	1.0	0.10	ug/L			03/15/21 16:30	1
Vinyl chloride	1.0	U H	1.0	0.20	ug/L			03/15/21 16:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*75 - 130*		*03/15/21 16:30*	*1*
4-Bromofluorobenzene (Surr)	*93*		*47 - 134*		*03/15/21 16:30*	*1*
Toluene-d8 (Surr)	*95*		*69 - 122*		*03/15/21 16:30*	*1*
Dibromofluoromethane (Surr)	*84*		*78 - 129*		*03/15/21 16:30*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144503-1

Client Sample ID: MW-150S_021121
Date Collected: 02/11/21 15:15
Date Received: 02/13/21 08:00

Lab Sample ID: 240-144503-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 20:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*78*		*70 - 133*		*02/18/21 20:52*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/19/21 22:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/19/21 22:57	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/19/21 22:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/19/21 22:57	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/19/21 22:57	1
Vinyl chloride	**0.35**	**J**	1.0	0.20	ug/L			02/19/21 22:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*111*		*75 - 130*		*02/19/21 22:57*	*1*
4-Bromofluorobenzene (Surr)	*69*		*47 - 134*		*02/19/21 22:57*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*02/19/21 22:57*	*1*
Dibromofluoromethane (Surr)	*116*		*78 - 129*		*02/19/21 22:57*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144503-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
190-25454-E-1 MS	Matrix Spike	79	97	95	83
190-25454-F-1 MSD	Matrix Spike Duplicate	84	95	95	86
240-144483-A-2 MS	Matrix Spike	88	92	88	98
240-144483-A-2 MSD	Matrix Spike Duplicate	89	88	90	90
240-144503-1	TRIP BLANK	81	93	95	84
240-144503-2	MW-150S_021121	111	69	80	116
LCS 240-473762/4	Lab Control Sample	91	93	88	98
LCS 240-476776/4	Lab Control Sample	78	94	97	83
MB 240-473762/7	Method Blank	100	66	76	107
MB 240-476776/7	Method Blank	80	91	98	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144425-C-2 MS	Matrix Spike	82
240-144425-C-2 MSD	Matrix Spike Duplicate	81
240-144503-2	MW-150S_021121	78
LCS 240-473604/4	Lab Control Sample	81
MB 240-473604/5	Method Blank	80

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473762/7
Matrix: Water
Analysis Batch: 473762

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/19/21 14:36	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/19/21 14:36	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/19/21 14:36	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/19/21 14:36	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/19/21 14:36	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/19/21 14:36	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*02/19/21 14:36*	*1*
4-Bromofluorobenzene (Surr)	*66*		*47 - 134*		*02/19/21 14:36*	*1*
Toluene-d8 (Surr)	*76*		*69 - 122*		*02/19/21 14:36*	*1*
Dibromofluoromethane (Surr)	*107*		*78 - 129*		*02/19/21 14:36*	*1*

Lab Sample ID: LCS 240-473762/4
Matrix: Water
Analysis Batch: 473762

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.4		ug/L		104	73 - 129
cis-1,2-Dichloroethene	10.0	10.2		ug/L		102	75 - 124
Tetrachloroethene	10.0	12.1		ug/L		121	70 - 125
trans-1,2-Dichloroethene	10.0	11.2		ug/L		112	74 - 130
Trichloroethene	10.0	10.7		ug/L		107	71 - 121
Vinyl chloride	10.0	9.44		ug/L		94	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*91*		*75 - 130*
4-Bromofluorobenzene (Surr)	*93*		*47 - 134*
Toluene-d8 (Surr)	*88*		*69 - 122*
Dibromofluoromethane (Surr)	*98*		*78 - 129*

Lab Sample ID: 240-144483-A-2 MS
Matrix: Water
Analysis Batch: 473762

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	91	J	1000	1110		ug/L		102	64 - 132
cis-1,2-Dichloroethene	100	U	1000	955		ug/L		96	68 - 121
Tetrachloroethene	100	U	1000	1130		ug/L		113	52 - 129
trans-1,2-Dichloroethene	100	U	1000	1050		ug/L		105	69 - 126
Trichloroethene	1900		1000	2670		ug/L		78	56 - 124
Vinyl chloride	100	U	1000	965		ug/L		96	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 130*
4-Bromofluorobenzene (Surr)	*92*		*47 - 134*
Toluene-d8 (Surr)	*88*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144483-A-2 MS
Matrix: Water
Analysis Batch: 473762

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*98*		*78 - 129*

Lab Sample ID: 240-144483-A-2 MSD
Matrix: Water
Analysis Batch: 473762

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	91	J	1000	1030		ug/L		94	64 - 132	7	35
cis-1,2-Dichloroethene	100	U	1000	976		ug/L		98	68 - 121	2	35
Tetrachloroethene	100	U	1000	1120		ug/L		112	52 - 129	1	35
trans-1,2-Dichloroethene	100	U	1000	997		ug/L		100	69 - 126	5	35
Trichloroethene	1900		1000	2640		ug/L		75	56 - 124	1	35
Vinyl chloride	100	U	1000	903		ug/L		90	49 - 136	7	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*75 - 130*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*
Toluene-d8 (Surr)	*90*		*69 - 122*
Dibromofluoromethane (Surr)	*90*		*78 - 129*

Lab Sample ID: MB 240-476776/7
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/15/21 15:40	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/15/21 15:40	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/15/21 15:40	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/15/21 15:40	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/15/21 15:40	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/15/21 15:40	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*75 - 130*		*03/15/21 15:40*	*1*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*		*03/15/21 15:40*	*1*
Toluene-d8 (Surr)	*98*		*69 - 122*		*03/15/21 15:40*	*1*
Dibromofluoromethane (Surr)	*81*		*78 - 129*		*03/15/21 15:40*	*1*

Lab Sample ID: LCS 240-476776/4
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,1-Dichloroethene			10.0	8.48		ug/L		85	73 - 129		
cis-1,2-Dichloroethene			10.0	9.17		ug/L		92	75 - 124		
Tetrachloroethene			10.0	10.2		ug/L		102	70 - 125		
trans-1,2-Dichloroethene			10.0	8.93		ug/L		89	74 - 130		
Trichloroethene			10.0	8.97		ug/L		90	71 - 121		

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-476776/4
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Vinyl chloride			10.0	11.1		ug/L		111	61 - 134		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*78*		*75 - 130*
4-Bromofluorobenzene (Surr)	*94*		*47 - 134*
Toluene-d8 (Surr)	*97*		*69 - 122*
Dibromofluoromethane (Surr)	*83*		*78 - 129*

Lab Sample ID: 190-25454-E-1 MS
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,1-Dichloroethene	1.0	U	10.0	6.81		ug/L		68	64 - 132		
cis-1,2-Dichloroethene	1.0	U	10.0	7.96		ug/L		80	68 - 121		
Tetrachloroethene	1.0	U	10.0	8.88		ug/L		89	52 - 129		
trans-1,2-Dichloroethene	1.0	U	10.0	7.48		ug/L		75	69 - 126		
Trichloroethene	1.0	U	10.0	7.78		ug/L		78	56 - 124		
Vinyl chloride	1.0	U	10.0	9.92		ug/L		99	49 - 136		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*75 - 130*
4-Bromofluorobenzene (Surr)	*97*		*47 - 134*
Toluene-d8 (Surr)	*95*		*69 - 122*
Dibromofluoromethane (Surr)	*83*		*78 - 129*

Lab Sample ID: 190-25454-F-1 MSD
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	6.82		ug/L		68	64 - 132	0	35
cis-1,2-Dichloroethene	1.0	U	10.0	8.09		ug/L		81	68 - 121	2	35
Tetrachloroethene	1.0	U	10.0	8.78		ug/L		88	52 - 129	1	35
trans-1,2-Dichloroethene	1.0	U	10.0	7.87		ug/L		79	69 - 126	5	35
Trichloroethene	1.0	U	10.0	8.10		ug/L		81	56 - 124	4	35
Vinyl chloride	1.0	U	10.0	10.4		ug/L		104	49 - 136	4	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*95*		*69 - 122*
Dibromofluoromethane (Surr)	*86*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473604/5
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 12:27	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/18/21 12:27*	*1*

Lab Sample ID: LCS 240-473604/4
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.5		ug/L		105	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

Lab Sample ID: 240-144425-C-2 MS
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	11.1		ug/L		111	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144425-C-2 MSD
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.7		ug/L		107	46 - 170	3	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

GC/MS VOA

Analysis Batch: 473604

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144503-2	MW-150S_021121	Total/NA	Water	8260B SIM	
MB 240-473604/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-473604/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144425-C-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144425-C-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 473762

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144503-2	MW-150S_021121	Total/NA	Water	8260B	
MB 240-473762/7	Method Blank	Total/NA	Water	8260B	
LCS 240-473762/4	Lab Control Sample	Total/NA	Water	8260B	
240-144483-A-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144483-A-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 476776

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144503-1	TRIP BLANK	Total/NA	Water	8260B	
MB 240-476776/7	Method Blank	Total/NA	Water	8260B	
LCS 240-476776/4	Lab Control Sample	Total/NA	Water	8260B	
190-25454-E-1 MS	Matrix Spike	Total/NA	Water	8260B	
190-25454-F-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144503-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144503-1

Date Collected: 02/11/21 00:00
Matrix: Water
Date Received: 02/13/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	476776	03/15/21 16:30	LRW	TAL CAN

Client Sample ID: MW-150S_021121

Lab Sample ID: 240-144503-2

Date Collected: 02/11/21 15:15
Matrix: Water
Date Received: 02/13/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473762	02/19/21 22:57	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	473604	02/18/21 20:52	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144503-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

MICHIGAN 190 TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
City/State/Zip: Novi, MI. 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-150S 021121	2/11/21	1515		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-144503 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Emma Witherspoon	Arcadis	2/11/21 1700	Novi Gold Storage	Arcadis	2/11/21 1700
[illegible]	Arcadis	2/12/2021	Amanda Battershell	ETA	2/12/21 10:05
Amanda Battershell	ETA	2/12/21 11:01	[illegible]	ETA	2-13-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 144503
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Ryan C

Cooler Received on 2-13-21 Opened on 2-13-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.5 °C Corrected Cooler Temp. 1.6 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 59072	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

March 26, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144503-1
Sample date: 2021-02-11
Report received by CADENA: 2021-03-26
Initial Data Verification completed by CADENA: 2021-03-26
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

> HTQ - GCMS VOC sample TRIP BLANK analysis was performed outside of reference holding time due to an initial sample mix-up so all associated results should be considered to be estimated and qualified with UJ flags if non-detect.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Qualified Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144503-1

Sample Name: TRIP BLANK
Lab Sample ID: 2401445031
Sample Date: 2/11/2021

Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC					
OSW-8260B					
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	UJ
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	UJ
Tetrachloroethene	127-18-4	ND	1.0	ug/l	UJ
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	UJ
Trichloroethene	79-01-6	ND	1.0	ug/l	UJ
Vinyl chloride	75-01-4	ND	1.0	ug/l	UJ

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144503-1

		Sample Name:	TRIP BLANK				MW-150S_021121			
		Lab Sample ID:	2401445031				2401445032			
		Sample Date:	2/11/2021				2/11/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	UJ	0.35	1.0	ug/l	J
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

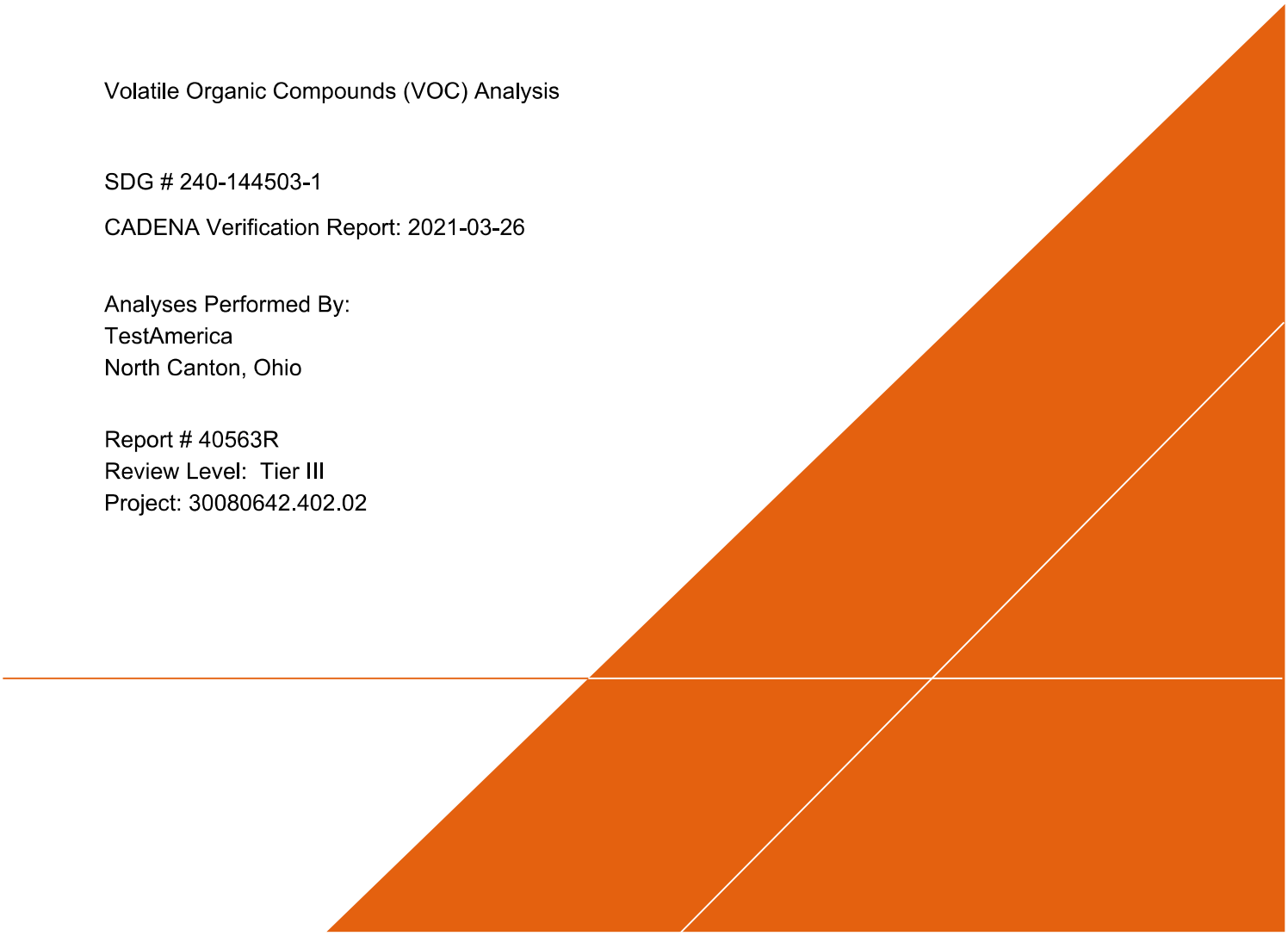
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144503-1

CADENA Verification Report: 2021-03-26

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40563R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144503-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144503-1	Water	02/11/2021		X	
MW-150S_021121	240-144503-2	Water	02/11/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

The analyses that exceeded the holding are presented in the following table.

Sample ID	Holding Time	Criteria
TRIP BLANK	32 days	14 days from collection to analysis

Sample results associated with samples mentioned in the table above, analyzed by analytical method SW-846 8260B were qualified, as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

DATA REVIEW

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X	X		
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

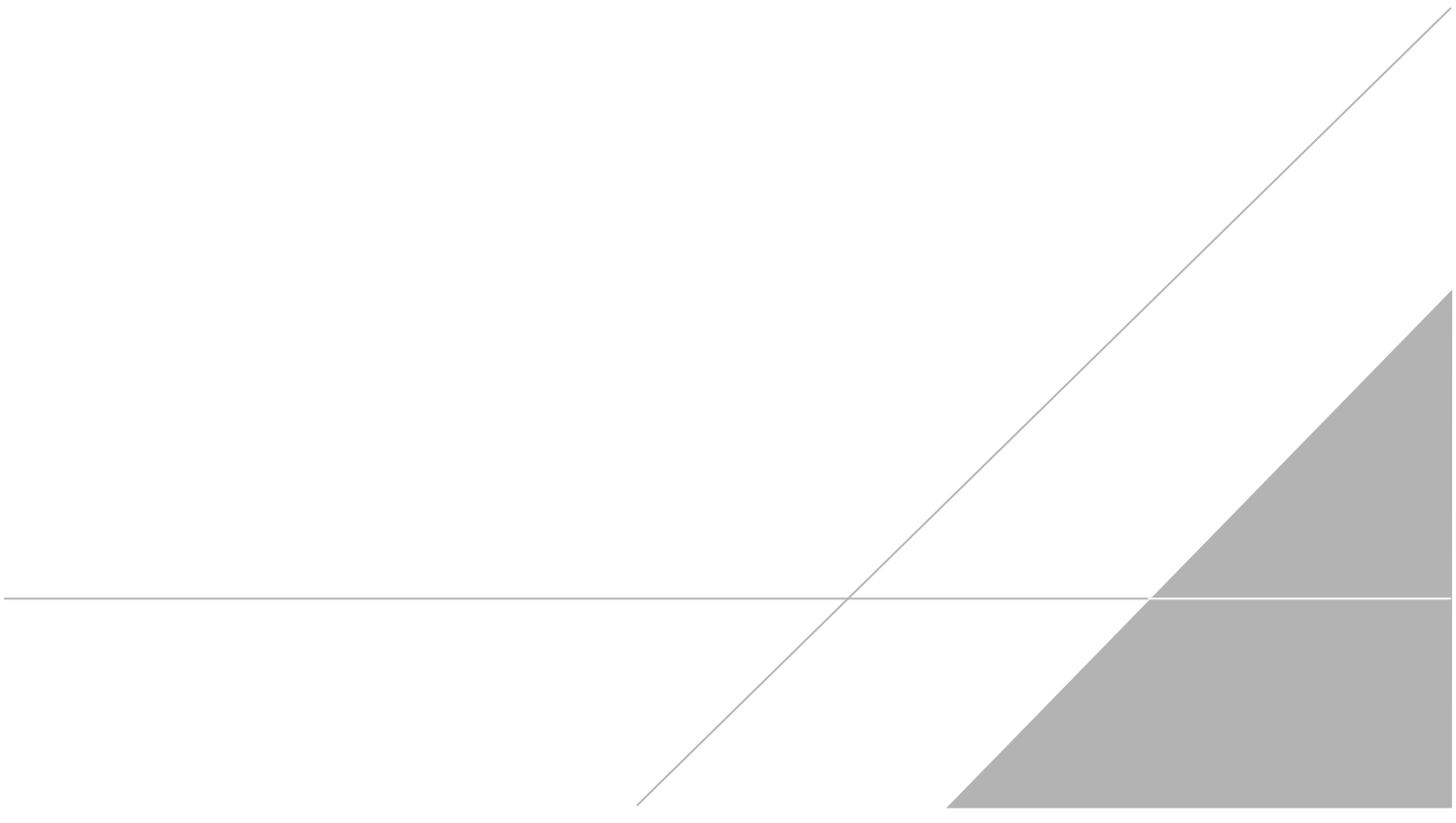
DATE: March 30, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 30, 2021

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



Chain of Custody Record

MICHIGAN 190 TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of COCs
City/State/Zip: Novi, MI. 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client; Lab sampling; Job/SDG No:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			
Project Number: 30050315.402.04	Shipping/Tracking No:			
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Acet/NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 trip blank
MW-150S 021121	2/11/21	1515		6						6					N	G	X	X	X	X	X	X	X	3 voas for 8260B; 3 voas for 8260B SIM

240-144503 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; ✓ Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Emma Witherspoon	Arcadis	2/11/21 1700	Novi Cold Storage	Arcadis	2/11/21 1700
Mike McClafferty	Arcadis	2/12/2021	Amanda Battershell	ETA	2/12/21 10:05
Amanda Battershell	ETA	2/12/21 11:01		ETA	2-13-21 800

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144503-1

Date Collected: 02/11/21 00:00
Matrix: Water
Date Received: 02/13/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
~~1,1-Dichloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.19~~	~~ug/L~~			~~03/15/21 16:30~~	R 1
~~cis-1,2-Dichloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.16~~	~~ug/L~~			~~03/15/21 16:30~~	R 1
~~Tetrachloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.15~~	~~ug/L~~			~~03/15/21 16:30~~	R 1
~~trans-1,2-Dichloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.19~~	~~ug/L~~			~~03/15/21 16:30~~	R 1
~~Trichloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.10~~	~~ug/L~~			~~03/15/21 16:30~~	R 1
~~Vinyl chloride~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.20~~	~~ug/L~~			~~03/15/21 16:30~~	R 1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*75 - 130*		*03/15/21 16:30*	*1*
4-Bromofluorobenzene (Surr)	*93*		*47 - 134*		*03/15/21 16:30*	*1*
Toluene-d8 (Surr)	*95*		*69 - 122*		*03/15/21 16:30*	*1*
Dibromofluoromethane (Surr)	*84*		*78 - 129*		*03/15/21 16:30*	*1*

Client Sample ID: MW-150S_021121
Lab Sample ID: 240-144503-2

Date Collected: 02/11/21 15:15
Matrix: Water
Date Received: 02/13/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 20:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*78*		*70 - 133*		*02/18/21 20:52*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/19/21 22:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/19/21 22:57	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/19/21 22:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/19/21 22:57	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/19/21 22:57	1
Vinyl chloride	**0.35**	**J**	1.0	0.20	ug/L			02/19/21 22:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*111*		*75 - 130*		*02/19/21 22:57*	*1*
4-Bromofluorobenzene (Surr)	*69*		*47 - 134*		*02/19/21 22:57*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*02/19/21 22:57*	*1*
Dibromofluoromethane (Surr)	*116*		*78 - 129*		*02/19/21 22:57*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144358-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
2/18/2021 2:52:31 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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Have a Question? Ask The Expert

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144358-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144358-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144358-1

Comments
No additional comments.

Receipt
The samples were received on 2/11/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.2° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144358-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144358-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144358-1	TRIP BLANK	Water	02/09/21 00:00	02/11/21 08:00	
240-144358-2	MW-90S_020921	Water	02/09/21 15:15	02/11/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144358-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144358-1

No Detections.

Client Sample ID: MW-90S_020921 — Lab Sample ID: 240-144358-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144358-1

Client Sample ID: TRIP BLANK
Date Collected: 02/09/21 00:00
Date Received: 02/11/21 08:00

Lab Sample ID: 240-144358-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/16/21 12:09	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/16/21 12:09	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/16/21 12:09	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/16/21 12:09	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/16/21 12:09	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/16/21 12:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 130*		*02/16/21 12:09*	*1*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*		*02/16/21 12:09*	*1*
Toluene-d8 (Surr)	*99*		*69 - 122*		*02/16/21 12:09*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*02/16/21 12:09*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144358-1

Client Sample ID: MW-90S_020921

Date Collected: 02/09/21 15:15
Date Received: 02/11/21 08:00

Lab Sample ID: 240-144358-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 15:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*70 - 133*		*02/12/21 15:26*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/16/21 12:32	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/16/21 12:32	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/16/21 12:32	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/16/21 12:32	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/16/21 12:32	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/16/21 12:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*		*02/16/21 12:32*	*1*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*		*02/16/21 12:32*	*1*
Toluene-d8 (Surr)	*100*		*69 - 122*		*02/16/21 12:32*	*1*
Dibromofluoromethane (Surr)	*97*		*78 - 129*		*02/16/21 12:32*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144358-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144358-1	TRIP BLANK	98	91	99	98
240-144358-2	MW-90S_020921	93	91	100	97
240-144422-B-3 MS	Matrix Spike	97	101	105	100
240-144422-B-3 MSD	Matrix Spike Duplicate	94	95	103	100
LCS 240-473222/4	Lab Control Sample	104	108	112	112
MB 240-473222/6	Method Blank	89	83	90	89

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144358-2	MW-90S_020921	85
240-144376-F-3 MS	Matrix Spike	83
240-144376-F-3 MSD	Matrix Spike Duplicate	82
LCS 240-472900/4	Lab Control Sample	82
MB 240-472900/5	Method Blank	82

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473222/6
Matrix: Water
Analysis Batch: 473222

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/16/21 11:47	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/16/21 11:47	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/16/21 11:47	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/16/21 11:47	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/16/21 11:47	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/16/21 11:47	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*75 - 130*		*02/16/21 11:47*	*1*
4-Bromofluorobenzene (Surr)	*83*		*47 - 134*		*02/16/21 11:47*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*02/16/21 11:47*	*1*
Dibromofluoromethane (Surr)	*89*		*78 - 129*		*02/16/21 11:47*	*1*

Lab Sample ID: LCS 240-473222/4
Matrix: Water
Analysis Batch: 473222

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.9		ug/L		109	73 - 129
cis-1,2-Dichloroethene	10.0	11.0		ug/L		110	75 - 124
Tetrachloroethene	10.0	11.4		ug/L		114	70 - 125
trans-1,2-Dichloroethene	10.0	11.3		ug/L		113	74 - 130
Trichloroethene	10.0	11.2		ug/L		112	71 - 121
Vinyl chloride	10.0	10.4		ug/L		104	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*
4-Bromofluorobenzene (Surr)	*108*		*47 - 134*
Toluene-d8 (Surr)	*112*		*69 - 122*
Dibromofluoromethane (Surr)	*112*		*78 - 129*

Lab Sample ID: 240-144422-B-3 MS
Matrix: Water
Analysis Batch: 473222

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*
4-Bromofluorobenzene (Surr)	*101*		*47 - 134*
Toluene-d8 (Surr)	*105*		*69 - 122*
Dibromofluoromethane (Surr)	*100*		*78 - 129*

Lab Sample ID: 240-144422-B-3 MSD
Matrix: Water
Analysis Batch: 473222

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*94*		*75 - 130*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144422-B-3 MSD
Matrix: Water
Analysis Batch: 473222

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*103*		*69 - 122*
Dibromofluoromethane (Surr)	*100*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-472900/5
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 12:29	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/12/21 12:29*	*1*

Lab Sample ID: LCS 240-472900/4
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.6		ug/L		106	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144376-F-3 MS
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	10.8		ug/L		108	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*

Lab Sample ID: 240-144376-F-3 MSD
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.8		ug/L		108	46 - 170	1	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

GC/MS VOA

Analysis Batch: 472900

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144358-2	MW-90S_020921	Total/NA	Water	8260B SIM	
MB 240-472900/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-472900/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144376-F-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144376-F-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 473222

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144358-1	TRIP BLANK	Total/NA	Water	8260B	
240-144358-2	MW-90S_020921	Total/NA	Water	8260B	
MB 240-473222/6	Method Blank	Total/NA	Water	8260B	
LCS 240-473222/4	Lab Control Sample	Total/NA	Water	8260B	
240-144422-B-3 MS	Matrix Spike	Total/NA	Water	8260B	
240-144422-B-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144358-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144358-1

Date Collected: 02/09/21 00:00

Matrix: Water

Date Received: 02/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473222	02/16/21 12:09	LEE	TAL CAN

Client Sample ID: MW-90S_020921

Lab Sample ID: 240-144358-2

Date Collected: 02/09/21 15:15

Matrix: Water

Date Received: 02/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473222	02/16/21 12:32	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	472900	02/12/21 15:26	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144358-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

MICHIGAN 190 TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Emma Witherspoon		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

COC No:

of COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below: 10 day ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day

Analyses

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM					Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X					Trip blank
MW-90S_020921	2/9/21	1515		6						6					N	G	X	X	X	X	X	X	X					3 vocs for 8260B 3 vocs for 8260B SIM

240-144358 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalla@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Swatherspoon	Arcadis	2/9/21 / 1700	Novi cold storage	Arcadis	2/9/21 / 1700
Julia McClafferty	Arcadis	2/10/2021	Amanda Battershell	ETA	2/10/21 10:12
Amanda Battershell	ETA	2/10/21 1309	Received in Laboratory by: [signature]	ETA	2-11-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 144358
Canton Facility

Client Arcadis Site Name

Cooler Received on 2-11-21 Opened on 2-11-21 @0800

Cooler unpacked by: MattSnyder

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # VA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2.1 °C Corrected Cooler Temp. 2.2 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	(No) NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	(Yes)	No
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?	(Y)	(N)
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 030310IF	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by: RyanC

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

February 18, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144358-1
Sample date: 2021-02-09
Report received by CADENA: 2021-02-18
Initial Data Verification completed by CADENA: 2021-02-18
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144358-1

		Sample Name:	TRIP BLANK				MW-90S_020921			
		Lab Sample ID:	2401443581				2401443582			
		Sample Date:	2/9/2021				2/9/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS Design & Consultancy for natural and built assets

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

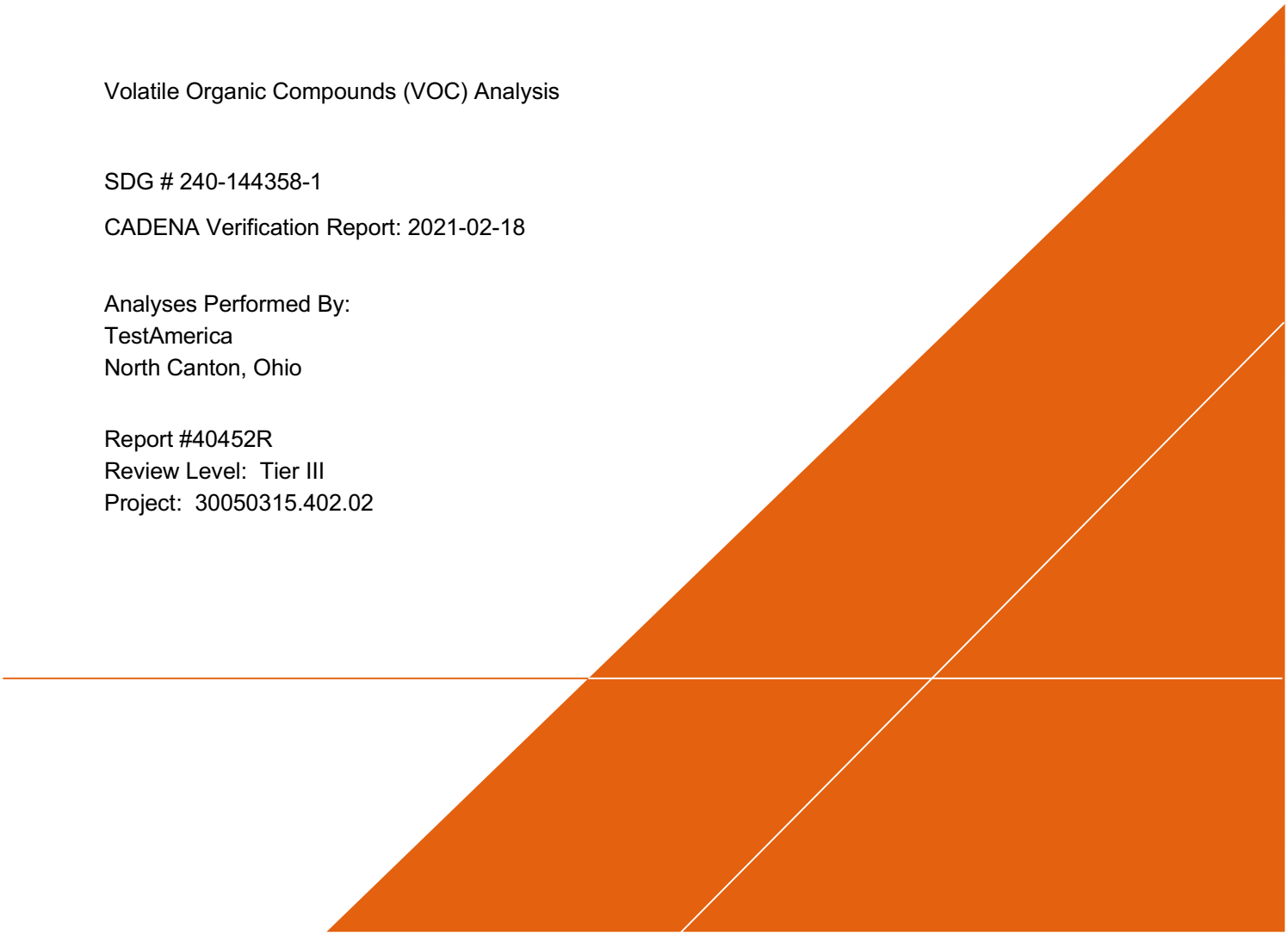
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144358-1

CADENA Verification Report: 2021-02-18

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report #40452R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144358-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					VOC
TRIP BLANK	240-144358-1	Water	02/09/2021		X
MW-90S_020921	240-144358-2	Water	02/09/2021		X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Prashanth K

SIGNATURE: 

DATE: March 08, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 10, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN TestAmerica 190
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	☐ DW ☐ NPDES ☐ RCRA ☐ Other	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
Address: 28550 Cabot Drive, Suite 500		Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377		Sampler Name: Emma Witherspoon	TAT if different from below 10 day ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client Lab sampling
Phone: 248-994-2240		Method of Shipment/Carrier:			
Project Name: Ford LTP Off-Site		Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04					
PO # 30050315.402.04					

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	Trip blank
MW-905_020921	2/9/21	1515		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-144358 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ an Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalla@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Emma Witherspoon	Arcadis	2/9/21 1700	Novi cold storage	Arcadis	2/9/21 1700
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Julia McClafferty	Arcadis	2/10/2021	Amanda Battenfield	ETA	2/10/21 10:12
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
Amanda Battenfield	ETA	2/10/21 1309		ETA	2-11-21 800

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02/18/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144358-1
Date Collected: 02/09/21 00:00
Matrix: Water
Date Received: 02/11/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/16/21 12:09	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/16/21 12:09	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/16/21 12:09	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/16/21 12:09	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/16/21 12:09	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/16/21 12:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 130*		*02/16/21 12:09*	*1*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*		*02/16/21 12:09*	*1*
Toluene-d8 (Surr)	*99*		*69 - 122*		*02/16/21 12:09*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*02/16/21 12:09*	*1*

Client Sample ID: MW-90S_020921
Lab Sample ID: 240-144358-2
Date Collected: 02/09/21 15:15
Matrix: Water
Date Received: 02/11/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 15:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*70 - 133*		*02/12/21 15:26*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/16/21 12:32	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/16/21 12:32	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/16/21 12:32	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/16/21 12:32	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/16/21 12:32	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/16/21 12:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*		*02/16/21 12:32*	*1*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*		*02/16/21 12:32*	*1*
Toluene-d8 (Surr)	*100*		*69 - 122*		*02/16/21 12:32*	*1*
Dibromofluoromethane (Surr)	*97*		*78 - 129*		*02/16/21 12:32*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144361-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
2/17/2021 10:30:16 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at:
www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144361-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144361-1

Comments
No additional comments.

Receipt
The samples were received on 2/11/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.2° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144361-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144361-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144361-1	TRIP BLANK	Water	02/09/21 00:00	02/11/21 08:00	
240-144361-2	MW-147S_020921	Water	02/09/21 12:30	02/11/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144361-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144361-1

No Detections.

Client Sample ID: MW-147S_020921 — Lab Sample ID: 240-144361-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	0.82	J	1.0	0.20	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144361-1

Client Sample ID: TRIP BLANK
Date Collected: 02/09/21 00:00
Date Received: 02/11/21 08:00

Lab Sample ID: 240-144361-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 15:23	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 15:23	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 15:23	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 15:23	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 15:23	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 15:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*		*02/15/21 15:23*	*1*
4-Bromofluorobenzene (Surr)	*83*		*47 - 134*		*02/15/21 15:23*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*02/15/21 15:23*	*1*
Dibromofluoromethane (Surr)	*96*		*78 - 129*		*02/15/21 15:23*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144361-1

Client Sample ID: MW-147S_020921
Date Collected: 02/09/21 12:30
Date Received: 02/11/21 08:00

Lab Sample ID: 240-144361-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 16:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/12/21 16:41*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 15:45	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 15:45	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 15:45	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 15:45	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 15:45	1
Vinyl chloride	**0.82**	**J**	1.0	0.20	ug/L			02/15/21 15:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*75 - 130*		*02/15/21 15:45*	*1*
4-Bromofluorobenzene (Surr)	*84*		*47 - 134*		*02/15/21 15:45*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*02/15/21 15:45*	*1*
Dibromofluoromethane (Surr)	*93*		*78 - 129*		*02/15/21 15:45*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144361-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144277-B-2 MS	Matrix Spike	91	95	105	99
240-144277-B-2 MSD	Matrix Spike Duplicate	93	90	99	99
240-144361-1	TRIP BLANK	93	83	90	96
240-144361-2	MW-147S_020921	91	84	90	93
LCS 240-473047/4	Lab Control Sample	99	102	106	104
MB 240-473047/6	Method Blank	86	81	92	93

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144361-2	MW-147S_020921	83
240-144376-F-3 MS	Matrix Spike	83
240-144376-F-3 MSD	Matrix Spike Duplicate	82
LCS 240-472900/4	Lab Control Sample	82
MB 240-472900/5	Method Blank	82

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473047/6
Matrix: Water
Analysis Batch: 473047

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 10:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 10:57	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 10:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 10:57	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 10:57	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 10:57	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*		*02/15/21 10:57*	*1*
4-Bromofluorobenzene (Surr)	*81*		*47 - 134*		*02/15/21 10:57*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*02/15/21 10:57*	*1*
Dibromofluoromethane (Surr)	*93*		*78 - 129*		*02/15/21 10:57*	*1*

Lab Sample ID: LCS 240-473047/4
Matrix: Water
Analysis Batch: 473047

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	11.1		ug/L		111	73 - 129
cis-1,2-Dichloroethene	10.0	10.6		ug/L		106	75 - 124
Tetrachloroethene	10.0	11.4		ug/L		114	70 - 125
trans-1,2-Dichloroethene	10.0	10.4		ug/L		104	74 - 130
Trichloroethene	10.0	10.4		ug/L		104	71 - 121
Vinyl chloride	10.0	9.92		ug/L		99	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*99*		*75 - 130*
4-Bromofluorobenzene (Surr)	*102*		*47 - 134*
Toluene-d8 (Surr)	*106*		*69 - 122*
Dibromofluoromethane (Surr)	*104*		*78 - 129*

Lab Sample ID: 240-144277-B-2 MS
Matrix: Water
Analysis Batch: 473047

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	67	U	667	598		ug/L		90	64 - 132
cis-1,2-Dichloroethene	1500		667	2140		ug/L		102	68 - 121
Tetrachloroethene	56	J	667	634		ug/L		87	52 - 129
Trichloroethene	1100		667	1670		ug/L		91	56 - 124
Vinyl chloride	160		667	734		ug/L		86	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*91*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*105*		*69 - 122*
Dibromofluoromethane (Surr)	*99*		*78 - 129*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144277-B-2 MSD
Matrix: Water
Analysis Batch: 473047

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	67	U	667	668		ug/L		100	64 - 132	11	35
cis-1,2-Dichloroethene	1500		667	2220		ug/L		113	68 - 121	3	35
Tetrachloroethene	56	J	667	730		ug/L		101	52 - 129	14	35
Trichloroethene	1100		667	1740		ug/L		101	56 - 124	4	35
Vinyl chloride	160		667	774		ug/L		92	49 - 136	5	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*90*		*47 - 134*
Toluene-d8 (Surr)	*99*		*69 - 122*
Dibromofluoromethane (Surr)	*99*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-472900/5
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 12:29	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/12/21 12:29*	*1*

Lab Sample ID: LCS 240-472900/4
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.6		ug/L		106	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144376-F-3 MS
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	10.8		ug/L		108	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144376-F-3 MSD
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.8		ug/L		108	46 - 170	1	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144361-1

GC/MS VOA

Analysis Batch: 472900

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144361-2	MW-147S_020921	Total/NA	Water	8260B SIM	
MB 240-472900/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-472900/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144376-F-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144376-F-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 473047

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144361-1	TRIP BLANK	Total/NA	Water	8260B	
240-144361-2	MW-147S_020921	Total/NA	Water	8260B	
MB 240-473047/6	Method Blank	Total/NA	Water	8260B	
LCS 240-473047/4	Lab Control Sample	Total/NA	Water	8260B	
240-144277-B-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144277-B-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144361-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144361-1

Date Collected: 02/09/21 00:00

Matrix: Water

Date Received: 02/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473047	02/15/21 15:23	LEE	TAL CAN

Client Sample ID: MW-147S_020921

Lab Sample ID: 240-144361-2

Date Collected: 02/09/21 12:30

Matrix: Water

Date Received: 02/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473047	02/15/21 15:45	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	472900	02/12/21 16:41	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144361-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190

TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	For lab use only
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	Walk-in client
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below: ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30050315.402.04	Shipping/Tracking No:			
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac / NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	TRIP blank
MW-147S_020921	2/9/21	1230		6						6					N	G	X	X	X	X	X	X	X	3 vials for 8260B; 3 vials for 8260B SIM

240-144361 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com, Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Emma Witherspoon	Arcadis	2/9/21 1700	Cold Storage	Arcadis	2/9/21 1700
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Arcadis	2/10/2021	Amanda Battershell	ETA	2/10/21 1012
Relinquished by: Amanda Battershell	Company: ETA	Date/Time: 2/10/21 1309	Received in Laboratory by:	Company: ETA	Date/Time: 2-11-21 800

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2/17/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 144361**
Canton Facility

Client Arcadis Site Name

Cooler Received on 2-11-21 Opened on 2-11-21

Cooler unpacked by: MattSnyder

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # VA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2.1 °C Corrected Cooler Temp. 2.2 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No NA	pH Strip Lot# HC907861
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #	Yes	No
17. Was a LL Hg or Me Hg trip blank present?	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container.
Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.
Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

DATA VERIFICATION REPORT

February 17, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144361-1
Sample date: 2021-02-09
Report received by CADENA: 2021-02-17
Initial Data Verification completed by CADENA: 2021-02-17
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144361-1

		Sample Name:	TRIP BLANK				MW-147S_020921			
		Lab Sample ID:	2401443611				2401443612			
		Sample Date:	2/9/2021				2/9/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	0.82	1.0	ug/l	J
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS Design & Consultancy for natural and built assets

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

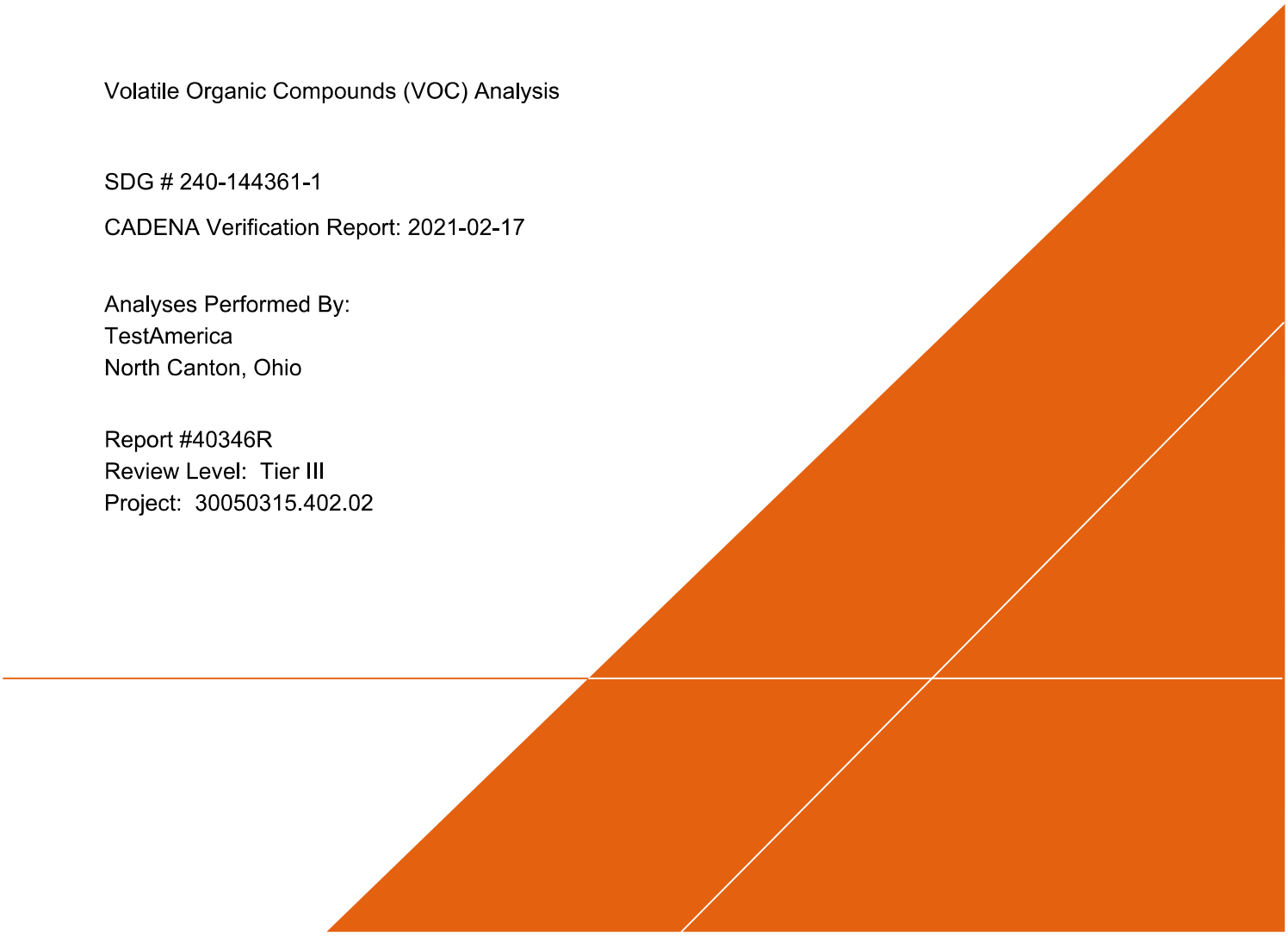
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144361-1

CADENA Verification Report: 2021-02-17

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report #40346R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144361-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					VOC
TRIP BLANK	240-144361-1	Water	02/09/2021		X
MW-147S_020921	240-144361-2	Water	02/09/2021		X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent

sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: February 23, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 05, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica MICHIGAN 190 — THE LEADER IN ENVIRONMENTAL TESTING

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below: ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling:
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 TRIP blank
MW-147S_020921	2/9/21	1230		6						6					N	G	X	X	X	X	X	X	X	3 vials for 8260B; 3 vials for 8260B SIM

240-144361 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Emma Witherspoon	Arcadis	2/9/21 1700	Non cold Storage	Arcadis	2/9/21 1700
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Arcadis	2/10/2021	Amanda Battershill	ETA	2/10/21 1012
Relinquished by: Amanda Battershill	Company: ETA	Date/Time: 2/10/21 1309	Received in Laboratory by:	Company: ETA	Date/Time: 2-11-21 800

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144361-1
Date Collected: 02/09/21 00:00
Matrix: Water
Date Received: 02/11/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 15:23	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 15:23	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 15:23	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 15:23	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 15:23	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 15:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*		*02/15/21 15:23*	*1*
4-Bromofluorobenzene (Surr)	*83*		*47 - 134*		*02/15/21 15:23*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*02/15/21 15:23*	*1*
Dibromofluoromethane (Surr)	*96*		*78 - 129*		*02/15/21 15:23*	*1*

Client Sample ID: MW-147S_020921
Lab Sample ID: 240-144361-2
Date Collected: 02/09/21 12:30
Matrix: Water
Date Received: 02/11/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 16:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/12/21 16:41*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 15:45	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 15:45	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 15:45	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 15:45	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 15:45	1
Vinyl chloride	**0.82**	**J**	1.0	0.20	ug/L			02/15/21 15:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*75 - 130*		*02/15/21 15:45*	*1*
4-Bromofluorobenzene (Surr)	*84*		*47 - 134*		*02/15/21 15:45*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*02/15/21 15:45*	*1*
Dibromofluoromethane (Surr)	*93*		*78 - 129*		*02/15/21 15:45*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144435-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
2/24/2021 11:22:16 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
Review your project results through TotalAccess
Have a Question? Ask The Expert
Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144435-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
F1	MS and/or MSD recovery exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144435-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144435-1

Comments
No additional comments.

Receipt
The samples were received on 2/12/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.4º C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) associated with batch 473553 recovered above the upper control limit for 1,1-Dichloroethene. The samples associated with this CCV were non-detect for the affected analyte; therefore, the data have been reported. The associated samples are impacted: TRIP BLANK (240-144435-1), MW-127S_021021 (240-144435-2) and DUP-13 (240-144435-3).

Method 8260B: The laboratory control sample (LCS) for 473553 recovered outside control limits for the following analyte: 1,1-Dichloroethene. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported: TRIP BLANK (240-144435-1), MW-127S_021021 (240-144435-2), DUP-13 (240-144435-3) and (LCS 240-473553/4).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144435-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144435-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144435-1	TRIP BLANK	Water	02/10/21 00:00	02/12/21 08:00	
240-144435-2	MW-127S_021021	Water	02/10/21 12:22	02/12/21 08:00	
240-144435-3	DUP-13	Water	02/10/21 00:00	02/12/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144435-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144435-1

No Detections.

Client Sample ID: MW-127S_021021 — Lab Sample ID: 240-144435-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	1.1		1.0	0.20	ug/L	1		8260B	Total/NA

Client Sample ID: DUP-13 — Lab Sample ID: 240-144435-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.92	J	2.0	0.86	ug/L	1		8260B SIM	Total/NA
Vinyl chloride	1.3		1.0	0.20	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144435-1

Client Sample ID: TRIP BLANK

Date Collected: 02/10/21 00:00
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144435-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/18/21 13:41	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/18/21 13:41	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/18/21 13:41	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 13:41	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/18/21 13:41	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/18/21 13:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*120*		*75 - 130*		*02/18/21 13:41*	*1*
4-Bromofluorobenzene (Surr)	*83*		*47 - 134*		*02/18/21 13:41*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*02/18/21 13:41*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*02/18/21 13:41*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144435-1

Client Sample ID: MW-127S_021021
Date Collected: 02/10/21 12:22
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144435-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 14:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*		*02/18/21 14:08*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/18/21 14:03	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/18/21 14:03	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/18/21 14:03	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 14:03	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/18/21 14:03	1
Vinyl chloride	**1.1**		1.0	0.20	ug/L			02/18/21 14:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*118*		*75 - 130*		*02/18/21 14:03*	*1*
4-Bromofluorobenzene (Surr)	*84*		*47 - 134*		*02/18/21 14:03*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*02/18/21 14:03*	*1*
Dibromofluoromethane (Surr)	*106*		*78 - 129*		*02/18/21 14:03*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144435-1

Client Sample ID: DUP-13
Date Collected: 02/10/21 00:00
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144435-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**0.92**	**J**	2.0	0.86	ug/L			02/17/21 12:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/17/21 12:05*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/18/21 14:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/18/21 14:24	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/18/21 14:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 14:24	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/18/21 14:24	1
Vinyl chloride	**1.3**		1.0	0.20	ug/L			02/18/21 14:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*123*		*75 - 130*		*02/18/21 14:24*	*1*
4-Bromofluorobenzene (Surr)	*83*		*47 - 134*		*02/18/21 14:24*	*1*
Toluene-d8 (Surr)	*89*		*69 - 122*		*02/18/21 14:24*	*1*
Dibromofluoromethane (Surr)	*108*		*78 - 129*		*02/18/21 14:24*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144435-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144435-1	TRIP BLANK	120	83	90	103
240-144435-2	MW-127S_021021	118	84	90	106
240-144435-3	DUP-13	123	83	89	108
240-144460-B-2 MS	Matrix Spike	111	110	100	102
240-144460-B-2 MSD	Matrix Spike Duplicate	104	107	99	95
LCS 240-473553/4	Lab Control Sample	105	107	96	95
MB 240-473553/7	Method Blank	116	86	91	101

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144425-C-2 MS	Matrix Spike	82
240-144425-C-2 MSD	Matrix Spike Duplicate	81
240-144435-2	MW-127S_021021	79
240-144435-3	DUP-13	82
240-144439-A-3 MS	Matrix Spike	84
240-144439-A-3 MSD	Matrix Spike Duplicate	85
LCS 240-473381/4	Lab Control Sample	80
LCS 240-473604/4	Lab Control Sample	81
MB 240-473381/5	Method Blank	81
MB 240-473604/5	Method Blank	80

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473553/7
Matrix: Water
Analysis Batch: 473553

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 12:13	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/18/21 12:13	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/18/21 12:13	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 12:13	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/18/21 12:13	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/18/21 12:13	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*75 - 130*		*02/18/21 12:13*	*1*
4-Bromofluorobenzene (Surr)	*86*		*47 - 134*		*02/18/21 12:13*	*1*
Toluene-d8 (Surr)	*91*		*69 - 122*		*02/18/21 12:13*	*1*
Dibromofluoromethane (Surr)	*101*		*78 - 129*		*02/18/21 12:13*	*1*

Lab Sample ID: LCS 240-473553/4
Matrix: Water
Analysis Batch: 473553

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	17.3	*+	ug/L		173	73 - 129
cis-1,2-Dichloroethene	10.0	9.52		ug/L		95	75 - 124
Tetrachloroethene	10.0	9.34		ug/L		93	70 - 125
trans-1,2-Dichloroethene	10.0	9.59		ug/L		96	74 - 130
Trichloroethene	10.0	9.06		ug/L		91	71 - 121
Vinyl chloride	10.0	8.30		ug/L		83	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*105*		*75 - 130*
4-Bromofluorobenzene (Surr)	*107*		*47 - 134*
Toluene-d8 (Surr)	*96*		*69 - 122*
Dibromofluoromethane (Surr)	*95*		*78 - 129*

Lab Sample ID: 240-144460-B-2 MS
Matrix: Water
Analysis Batch: 473553

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	2500	U F1 *+	25000	35500	F1	ug/L		142	64 - 132
cis-1,2-Dichloroethene	2900		25000	25500		ug/L		91	68 - 121
Tetrachloroethene	2500	U	25000	21400		ug/L		86	52 - 129
Trichloroethene	50000		25000	65000		ug/L		59	56 - 124
Vinyl chloride	2500	U	25000	15800		ug/L		63	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*111*		*75 - 130*
4-Bromofluorobenzene (Surr)	*110*		*47 - 134*
Toluene-d8 (Surr)	*100*		*69 - 122*
Dibromofluoromethane (Surr)	*102*		*78 - 129*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144460-B-2 MSD
Matrix: Water
Analysis Batch: 473553

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	2500	U F1 *+	25000	38200	F1	ug/L		153	64 - 132	7	35
cis-1,2-Dichloroethene	2900		25000	26200		ug/L		93	68 - 121	2	35
Tetrachloroethene	2500	U	25000	24000		ug/L		96	52 - 129	12	35
Trichloroethene	50000		25000	65000		ug/L		59	56 - 124	0	35
Vinyl chloride	2500	U	25000	18200		ug/L		73	49 - 136	14	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*
4-Bromofluorobenzene (Surr)	*107*		*47 - 134*
Toluene-d8 (Surr)	*99*		*69 - 122*
Dibromofluoromethane (Surr)	*95*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473381/5
Matrix: Water
Analysis Batch: 473381

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/17/21 09:33	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/17/21 09:33*	*1*

Lab Sample ID: LCS 240-473381/4
Matrix: Water
Analysis Batch: 473381

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.8		ug/L		108	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*

Lab Sample ID: 240-144439-A-3 MS
Matrix: Water
Analysis Batch: 473381

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	34		10.0	43.3		ug/L		91	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144439-A-3 MSD
Matrix: Water
Analysis Batch: 473381

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	34		10.0	42.6		ug/L		83	46 - 170	2	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*70 - 133*

Lab Sample ID: MB 240-473604/5
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 12:27	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/18/21 12:27*	*1*

Lab Sample ID: LCS 240-473604/4
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.5		ug/L		105	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

Lab Sample ID: 240-144425-C-2 MS
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	11.1		ug/L		111	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144425-C-2 MSD
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.7		ug/L		107	46 - 170	3	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144435-1

GC/MS VOA

Analysis Batch: 473381

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144435-3	DUP-13	Total/NA	Water	8260B SIM	
MB 240-473381/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-473381/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144439-A-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144439-A-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 473553

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144435-1	TRIP BLANK	Total/NA	Water	8260B	
240-144435-2	MW-127S_021021	Total/NA	Water	8260B	
240-144435-3	DUP-13	Total/NA	Water	8260B	
MB 240-473553/7	Method Blank	Total/NA	Water	8260B	
LCS 240-473553/4	Lab Control Sample	Total/NA	Water	8260B	
240-144460-B-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144460-B-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 473604

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144435-2	MW-127S_021021	Total/NA	Water	8260B SIM	
MB 240-473604/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-473604/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144425-C-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144425-C-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144435-1

Client Sample ID: TRIP BLANK
Date Collected: 02/10/21 00:00
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144435-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473553	02/18/21 13:41	LEE	TAL CAN

Client Sample ID: MW-127S_021021
Date Collected: 02/10/21 12:22
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144435-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473553	02/18/21 14:03	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	473604	02/18/21 14:08	SAM	TAL CAN

Client Sample ID: DUP-13
Date Collected: 02/10/21 00:00
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144435-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473553	02/18/21 14:24	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	473381	02/17/21 12:05	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144435-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

TestAmerica MICHIGAN 190 — THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Andrew Barth	TAT if different from below: 10 day; ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	2/10/21	—		1						1					N	G	X	X	X	X	X	X	X	Trip Blank
MW-127S-021021	2/10/21	1222		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260BSIM
DUP-13	2/10/21	-		5						5					N	G	X	X	X	X	X	X	X	5 VOAs ✓

240-144435 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by:	Arcadis	2/10/21 1725	Received by: Novi Cold Storage	Arcadis	2/10/21 1725
Relinquished by:	ARCADIS	2/11/21 0953	Received by:	ETA	2/11/21 0953
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company: FTS	Date/Time: 2-12-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 144435
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Ryan C

Cooler Received on 2-12-21 Opened on 2-12-21 800

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☑ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 3	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No RAC 2.12.21
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC907861
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 59072	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

_____

_____

_____

_____

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT



February 24, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144435-1
Sample date: 2021-02-10
Report received by CADENA: 2021-02-24
Initial Data Verification completed by CADENA: 2021-02-24
Number of Samples:3
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 473378 LCS recoveries were outliers biased high for the following analyte: 1,1-DICHLOROETHENE. Associated client sample results were non-detect so qualification was not required based on this high bias QC outlier.

GCMS VOC QC batch MS/MSD recovery outliers were not determined using a client sample so qualification was not required based on these sample-specific QC outliers.

GCMS VOC QC batch CCV response outliers as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144435-1

		Sample Name:	TRIP BLANK				MW-127S_021021				DUP-13			
		Lab Sample ID:	2401444351				2401444352				2401444353			
		Sample Date:	2/10/2021				2/10/2021				2/10/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC													
OSW-8260B													
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	1.1	1.0	ug/l	---	1.3	1.0	ug/l	---
OSW-8260BBSim													
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	0.92	2.0	ug/l	J

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

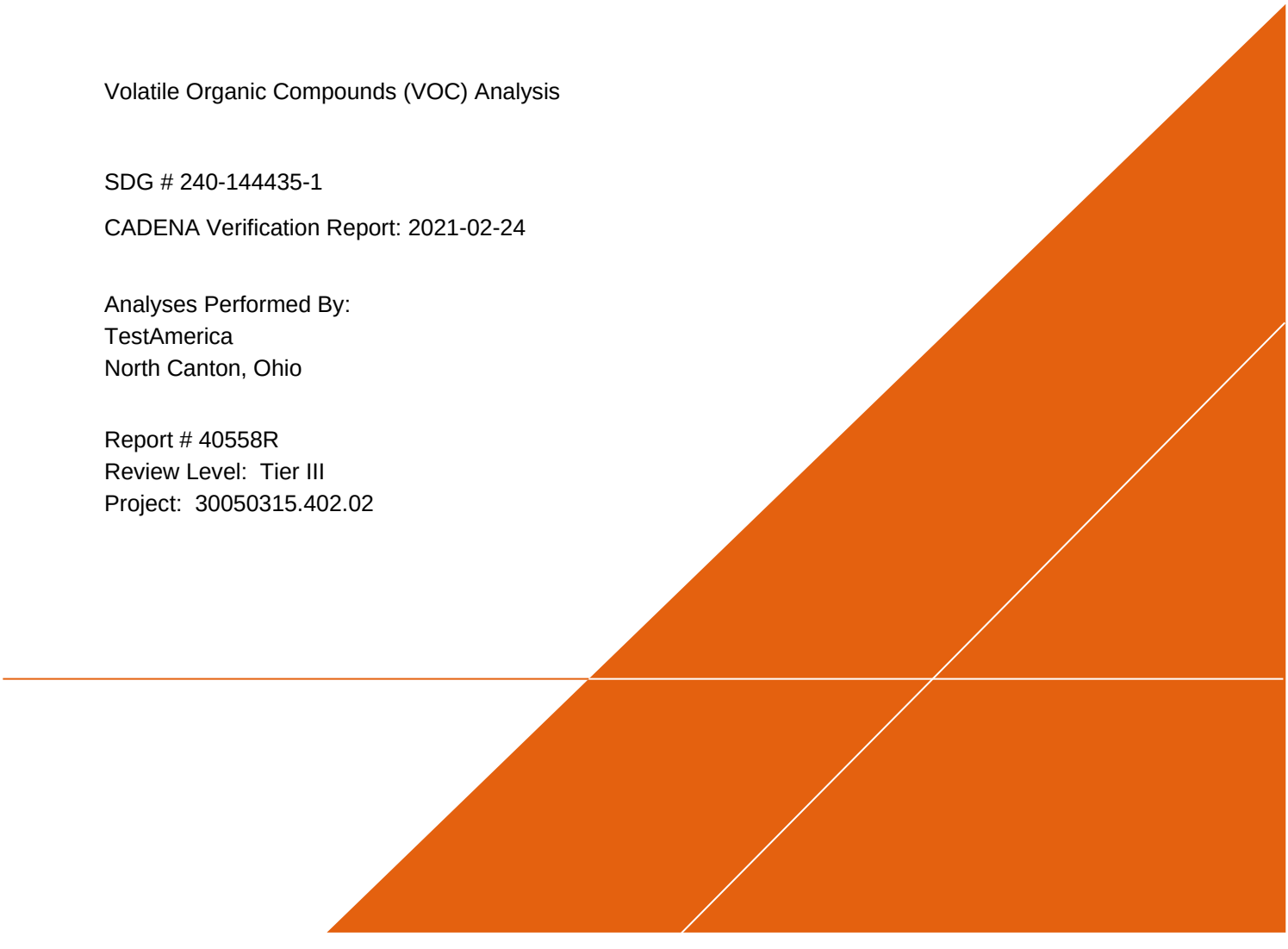
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144435-1

CADENA Verification Report: 2021-02-24

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40558R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144435-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144435-1	Water	02/10/2021		X	
MW-127S_021021	240-144435-2	Water	02/10/2021		X	X
DUP-13	240-144435-3	Water	02/10/2021	MW-127S_021021	X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial/Continuing	Compound	Criteria
TRIP BLANK MW-127S_021021 DUP-13	CCV %D	1,1-Dichloroethene	+47.8%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R

Initial/Continuing	Criteria	Sample Result	Qualification
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1] RRF of 0.01 only applies to compounds which are typically poor responding compounds (i.e., ketones, 1,4-dioxane, etc.)

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result (µg/L)	Duplicate Result (µg/L)	RPD
MW-127S_021021 / DUP-13	1,4-Dioxane	2.0 U	0.92 J	AC
	Vinyl chloride	1.1	1.3	AC

Notes:

U – Non detect

AC – Acceptable

The calculated differences between the parent sample and field duplicate were acceptable.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

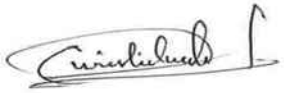
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 17, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190

TestAmerica — THE LEADER IN ENVIRONMENTAL TESTING

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Andrew Banitt		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below: 10 day — 3 weeks / ✓ 2 weeks / 1 week / 2 days / 1 day

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM					Sample Specific Notes / Special Instructions:
TRIP BLANK	2/10/21	—		1						1					N	G	X	X	X	X	X	X	X					Trip Blank
MW-1275-021021	2/10/21	1222		6						6					N	G	X	X	X	X	X	X	X					3 VOAs for 8260B 3 VOAs for 8260B SIM
DUP-13	2/10/21	-		5						5					N	G	X	X	X	X	X	X	X					5 VOAs

240-144435 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ✓ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	2/10/21 1725	Novi Cold Storage	Arcadis	2/10/21 1725
[signature]	ARCADIS	2/11/21 / 0953	[signature]	ETA	2/11/21 0953
			Received in Laboratory by: [signature]	ETA	2-12-21 800

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02/24/2021

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144435-1

Date Collected: 02/10/21 00:00

Matrix: Water

Date Received: 02/12/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 13:41	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/18/21 13:41	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/18/21 13:41	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 13:41	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/18/21 13:41	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/18/21 13:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*120*		*75 - 130*		*02/18/21 13:41*	*1*
4-Bromofluorobenzene (Surr)	*83*		*47 - 134*		*02/18/21 13:41*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*02/18/21 13:41*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*02/18/21 13:41*	*1*

Client Sample ID: MW-127S_021021

Lab Sample ID: 240-144435-2

Date Collected: 02/10/21 12:22

Matrix: Water

Date Received: 02/12/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 14:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*		*02/18/21 14:08*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 14:03	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/18/21 14:03	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/18/21 14:03	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 14:03	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/18/21 14:03	1
Vinyl chloride	**1.1**		1.0	0.20	ug/L			02/18/21 14:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*118*		*75 - 130*		*02/18/21 14:03*	*1*
4-Bromofluorobenzene (Surr)	*84*		*47 - 134*		*02/18/21 14:03*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*02/18/21 14:03*	*1*
Dibromofluoromethane (Surr)	*106*		*78 - 129*		*02/18/21 14:03*	*1*

Client Sample ID: DUP-13

Lab Sample ID: 240-144435-3

Date Collected: 02/10/21 00:00

Matrix: Water

Date Received: 02/12/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**0.92**	**J**	2.0	0.86	ug/L			02/17/21 12:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/17/21 12:05*	*1*

Client Sample ID: DUP-13
Date Collected: 02/10/21 00:00
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144435-3
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/18/21 14:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/18/21 14:24	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/18/21 14:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 14:24	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/18/21 14:24	1
Vinyl chloride	**1.3**		1.0	0.20	ug/L			02/18/21 14:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*123*		*75 - 130*		*02/18/21 14:24*	*1*
4-Bromofluorobenzene (Surr)	*83*		*47 - 134*		*02/18/21 14:24*	*1*
Toluene-d8 (Surr)	*89*		*69 - 122*		*02/18/21 14:24*	*1*
Dibromofluoromethane (Surr)	*108*		*78 - 129*		*02/18/21 14:24*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144360-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
2/17/2021 10:29:40 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144360-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144360-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144360-1

Comments
No additional comments.

Receipt
The samples were received on 2/11/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.2° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144360-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144360-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144360-1	TRIP BLANK	Water	02/09/21 00:00	02/11/21 08:00	
240-144360-2	MW-103S_020921	Water	02/09/21 14:10	02/11/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144360-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144360-1

No Detections.

Client Sample ID: MW-103S_020921 — Lab Sample ID: 240-144360-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144360-1

Client Sample ID: TRIP BLANK
Date Collected: 02/09/21 00:00
Date Received: 02/11/21 08:00

Lab Sample ID: 240-144360-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 14:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 14:38	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 14:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 14:38	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 14:38	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 14:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*75 - 130*		*02/15/21 14:38*	*1*
4-Bromofluorobenzene (Surr)	*86*		*47 - 134*		*02/15/21 14:38*	*1*
Toluene-d8 (Surr)	*98*		*69 - 122*		*02/15/21 14:38*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*02/15/21 14:38*	*1*

Client Sample ID: MW-103S_020921
Date Collected: 02/09/21 14:10
Date Received: 02/11/21 08:00

Lab Sample ID: 240-144360-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 16:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/12/21 16:16*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 15:01	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 15:01	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 15:01	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 15:01	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 15:01	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 15:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*		*02/15/21 15:01*	*1*
4-Bromofluorobenzene (Surr)	*78*		*47 - 134*		*02/15/21 15:01*	*1*
Toluene-d8 (Surr)	*86*		*69 - 122*		*02/15/21 15:01*	*1*
Dibromofluoromethane (Surr)	*84*		*78 - 129*		*02/15/21 15:01*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144360-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144277-B-2 MS	Matrix Spike	91	95	105	99
240-144277-B-2 MSD	Matrix Spike Duplicate	93	90	99	99
240-144360-1	TRIP BLANK	94	86	98	99
240-144360-2	MW-103S_020921	84	78	86	84
LCS 240-473047/4	Lab Control Sample	99	102	106	104
MB 240-473047/6	Method Blank	86	81	92	93

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144360-2	MW-103S_020921	82
240-144376-F-3 MS	Matrix Spike	83
240-144376-F-3 MSD	Matrix Spike Duplicate	82
LCS 240-472900/4	Lab Control Sample	82
MB 240-472900/5	Method Blank	82

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473047/6
Matrix: Water
Analysis Batch: 473047

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 10:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 10:57	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 10:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 10:57	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 10:57	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 10:57	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*		*02/15/21 10:57*	*1*
4-Bromofluorobenzene (Surr)	*81*		*47 - 134*		*02/15/21 10:57*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*02/15/21 10:57*	*1*
Dibromofluoromethane (Surr)	*93*		*78 - 129*		*02/15/21 10:57*	*1*

Lab Sample ID: LCS 240-473047/4
Matrix: Water
Analysis Batch: 473047

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	11.1		ug/L		111	73 - 129
cis-1,2-Dichloroethene	10.0	10.6		ug/L		106	75 - 124
Tetrachloroethene	10.0	11.4		ug/L		114	70 - 125
trans-1,2-Dichloroethene	10.0	10.4		ug/L		104	74 - 130
Trichloroethene	10.0	10.4		ug/L		104	71 - 121
Vinyl chloride	10.0	9.92		ug/L		99	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*99*		*75 - 130*
4-Bromofluorobenzene (Surr)	*102*		*47 - 134*
Toluene-d8 (Surr)	*106*		*69 - 122*
Dibromofluoromethane (Surr)	*104*		*78 - 129*

Lab Sample ID: 240-144277-B-2 MS
Matrix: Water
Analysis Batch: 473047

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	67	U	667	598		ug/L		90	64 - 132
cis-1,2-Dichloroethene	1500		667	2140		ug/L		102	68 - 121
Tetrachloroethene	56	J	667	634		ug/L		87	52 - 129
Trichloroethene	1100		667	1670		ug/L		91	56 - 124
Vinyl chloride	160		667	734		ug/L		86	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*91*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*105*		*69 - 122*
Dibromofluoromethane (Surr)	*99*		*78 - 129*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144277-B-2 MSD
Matrix: Water
Analysis Batch: 473047

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	67	U	667	668		ug/L		100	64 - 132	11	35
cis-1,2-Dichloroethene	1500		667	2220		ug/L		113	68 - 121	3	35
Tetrachloroethene	56	J	667	730		ug/L		101	52 - 129	14	35
Trichloroethene	1100		667	1740		ug/L		101	56 - 124	4	35
Vinyl chloride	160		667	774		ug/L		92	49 - 136	5	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*90*		*47 - 134*
Toluene-d8 (Surr)	*99*		*69 - 122*
Dibromofluoromethane (Surr)	*99*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-472900/5
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 12:29	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/12/21 12:29*	*1*

Lab Sample ID: LCS 240-472900/4
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.6		ug/L		106	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144376-F-3 MS
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	10.8		ug/L		108	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144376-F-3 MSD
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.8		ug/L		108	46 - 170	1	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

GC/MS VOA

Analysis Batch: 472900

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144360-2	MW-103S_020921	Total/NA	Water	8260B SIM	
MB 240-472900/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-472900/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144376-F-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144376-F-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 473047

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144360-1	TRIP BLANK	Total/NA	Water	8260B	
240-144360-2	MW-103S_020921	Total/NA	Water	8260B	
MB 240-473047/6	Method Blank	Total/NA	Water	8260B	
LCS 240-473047/4	Lab Control Sample	Total/NA	Water	8260B	
240-144277-B-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144277-B-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144360-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144360-1

Date Collected: 02/09/21 00:00
Matrix: Water
Date Received: 02/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473047	02/15/21 14:38	LEE	TAL CAN

Client Sample ID: MW-103S_020921

Lab Sample ID: 240-144360-2

Date Collected: 02/09/21 14:10
Matrix: Water
Date Received: 02/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473047	02/15/21 15:01	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	472900	02/12/21 16:16	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144360-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

MICHIGAN 190 — TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Site Contact	Lab Contact	COC No:
Company Name: Arcadis	☐ DW ☐ NPDES ☐ RCRA ☐ Other	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	
Address: 28550 Cabot Drive, Suite 500	Client Project Manager: Kris Hinskey	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of COCs
City/State/Zip: Novi, MI, 48377	Telephone: 248-994-2240			For lab use only
Phone: 248-994-2240	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	Walk-in client
Project Name: Ford LTP Off-Site	Sampler Name: EMMA Witherspoon	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Lab sampling
Project Number: 30050315.402.04	Method of Shipment/Carrier:			Job/SDG No:
PO # 30050315.402.04	Shipping/Tracking No:			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac / NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 TRIP Blank
MW-103S_020921	2/9/21	1410		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-144360 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalla@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
EWitherspoon	Arcadis	2/9/21 1700	Novi Cold storage	Arcadis	2/9/21 1700
Julia McClafferty	Arcadis	2/10/2021	Amanda Battershell	ETA	2/10/21 1012
Amanda Battershell	ETA	2/10/21 1309		ETA	2-11-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 144360
Canton Facility

Client Arcadis Site Name

Cooler Received on 2-11-21 Opened on 2-11-21

Cooler unpacked by: MattSnyder

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # VA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2.1 °C Corrected Cooler Temp. 2.2 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N) and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC907861
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 0303101F	Yes	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by: Ryan C

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

February 17, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144360-1
Sample date: 2021-02-09
Report received by CADENA: 2021-02-17
Initial Data Verification completed by CADENA: 2021-02-17
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144360-1

		Sample Name:	TRIP BLANK				MW-103S_020921			
		Lab Sample ID:	2401443601				2401443602			
		Sample Date:	2/9/2021				2/9/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS Design & Consultancy for natural and built assets

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

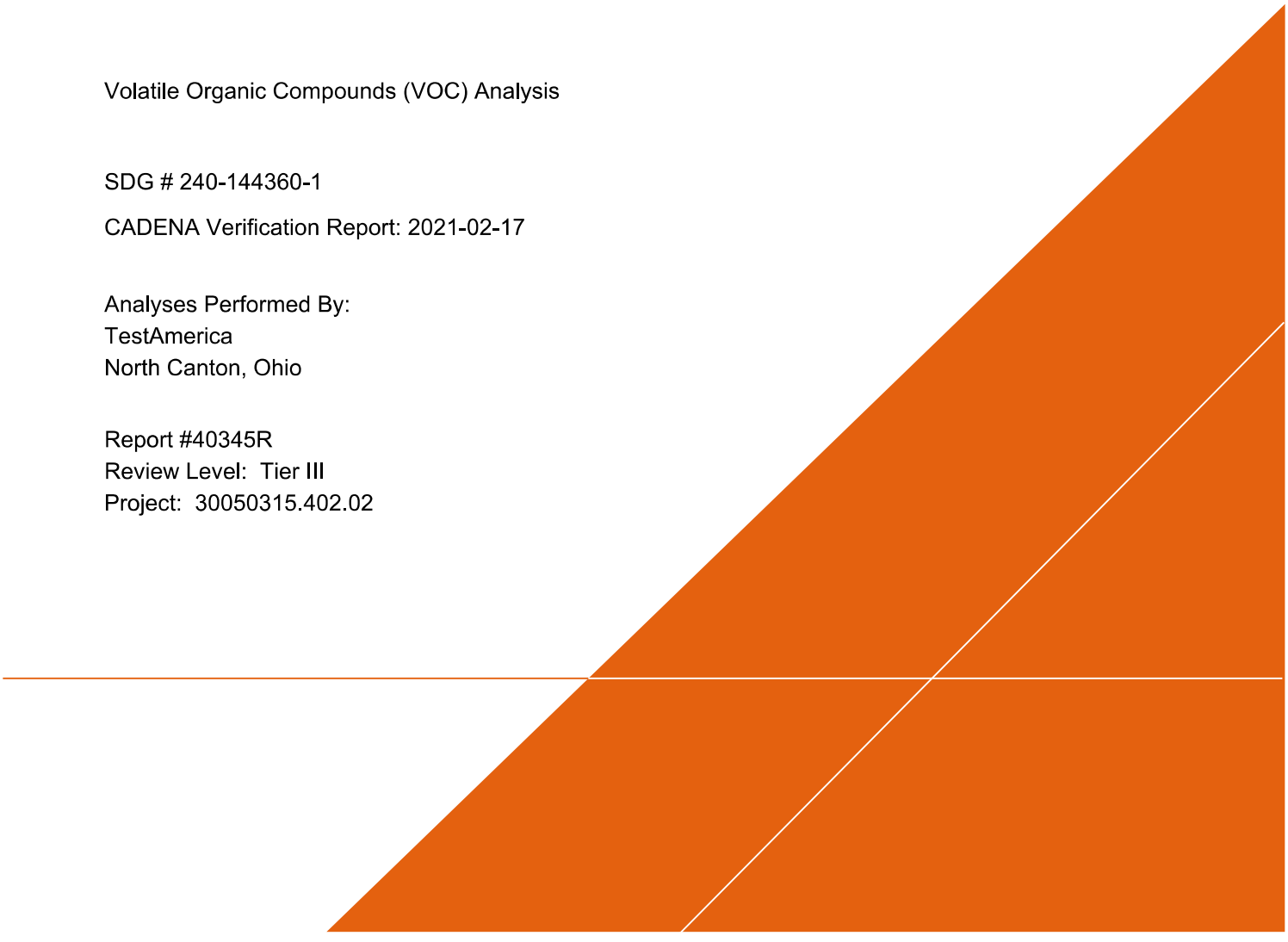
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144360-1

CADENA Verification Report: 2021-02-17

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report #40345R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144360-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					VOC
TRIP BLANK	240-144360-1	Water	02/09/2021		X
MW-103S_020921	240-144360-2	Water	02/09/2021		X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent

sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: February 23, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 05, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190 — TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: EMMA Witherspoon	TAT if different from below: 10 day; ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client: Lab sampling:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn/Ac NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 TRIP BLANK
MW-103S_020921	2/9/21	1410		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-144360 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
EMMA Witherspoon	Arcadis	2/9/21 1700	Novi cold storage	Arcadis	2/9/21 1700
Julia McClafferty	Arcadis	2/10/2021	Amanda Battershell	ETA	2/10/21 1012
Amanda Battershell	ETA	2/10/21 1309		ETA	2-11-21 800

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144360-1

Date Collected: 02/09/21 00:00
Matrix: Water
Date Received: 02/11/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 14:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 14:38	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 14:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 14:38	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 14:38	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 14:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*75 - 130*		*02/15/21 14:38*	*1*
4-Bromofluorobenzene (Surr)	*86*		*47 - 134*		*02/15/21 14:38*	*1*
Toluene-d8 (Surr)	*98*		*69 - 122*		*02/15/21 14:38*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*02/15/21 14:38*	*1*

Client Sample ID: MW-103S_020921
Lab Sample ID: 240-144360-2

Date Collected: 02/09/21 14:10
Matrix: Water
Date Received: 02/11/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 16:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/12/21 16:16*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 15:01	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 15:01	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 15:01	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 15:01	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 15:01	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 15:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*		*02/15/21 15:01*	*1*
4-Bromofluorobenzene (Surr)	*78*		*47 - 134*		*02/15/21 15:01*	*1*
Toluene-d8 (Surr)	*86*		*69 - 122*		*02/15/21 15:01*	*1*
Dibromofluoromethane (Surr)	*84*		*78 - 129*		*02/15/21 15:01*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144509-1
Client Project/Site: Ford LTP - Off Site
Revision: 1

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/26/2021 9:09:20 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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Have a Question? Ask The Expert

Visit us at:
www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Certification Summary 18
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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144509-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144509-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144509-1

Comments
No additional comments.

Revision
The report being provided is a revision of the original report sent on 2/25/2021. The report (revision 1) is being revised due to: Samples mislabeled during unpacking - revised to correct data..

Receipt
The samples were received on 2/13/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.6° C.

GC/MS VOA
Method 8260B: The following sample was analyzed outside of analytical holding time due to mis-labeled vial: TRIP BLANK (240-144509-1).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144509-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144509-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144509-1	TRIP BLANK	Water	02/11/21 00:00	02/13/21 08:00	
240-144509-2	MW-149S_021121	Water	02/11/21 12:10	02/13/21 08:00	
240-144509-4	DUP-15	Water	02/11/21 00:00	02/13/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144509-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144509-1

No Detections.

Client Sample ID: MW-149S_021121 — Lab Sample ID: 240-144509-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	1.7		1.0	0.20	ug/L	1		8260B	Total/NA

Client Sample ID: DUP-15 — Lab Sample ID: 240-144509-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	1.7		1.0	0.20	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144509-1

Client Sample ID: TRIP BLANK
Date Collected: 02/11/21 00:00
Date Received: 02/13/21 08:00

Lab Sample ID: 240-144509-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U H	1.0	0.19	ug/L			03/15/21 18:10	1
cis-1,2-Dichloroethene	1.0	U H	1.0	0.16	ug/L			03/15/21 18:10	1
Tetrachloroethene	1.0	U H	1.0	0.15	ug/L			03/15/21 18:10	1
trans-1,2-Dichloroethene	1.0	U H	1.0	0.19	ug/L			03/15/21 18:10	1
Trichloroethene	1.0	U H	1.0	0.10	ug/L			03/15/21 18:10	1
Vinyl chloride	1.0	U H	1.0	0.20	ug/L			03/15/21 18:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*75 - 130*		*03/15/21 18:10*	*1*
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*		*03/15/21 18:10*	*1*
Toluene-d8 (Surr)	*99*		*69 - 122*		*03/15/21 18:10*	*1*
Dibromofluoromethane (Surr)	*87*		*78 - 129*		*03/15/21 18:10*	*1*

Client Sample ID: MW-149S_021121
Date Collected: 02/11/21 12:10
Date Received: 02/13/21 08:00

Lab Sample ID: 240-144509-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/19/21 13:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/19/21 13:15*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 22:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 22:22	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 22:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 22:22	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 22:22	1
Vinyl chloride	**1.7**		1.0	0.20	ug/L			02/22/21 22:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*113*		*75 - 130*		*02/22/21 22:22*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*02/22/21 22:22*	*1*
Toluene-d8 (Surr)	*78*		*69 - 122*		*02/22/21 22:22*	*1*
Dibromofluoromethane (Surr)	*126*		*78 - 129*		*02/22/21 22:22*	*1*

Client Sample ID: DUP-15

Date Collected: 02/11/21 00:00
Date Received: 02/13/21 08:00

Lab Sample ID: 240-144509-4

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/19/21 12:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*		*02/19/21 12:49*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 21:59	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 21:59	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 21:59	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 21:59	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 21:59	1
Vinyl chloride	**1.7**		1.0	0.20	ug/L			02/22/21 21:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*115*		*75 - 130*		*02/22/21 21:59*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*02/22/21 21:59*	*1*
Toluene-d8 (Surr)	*81*		*69 - 122*		*02/22/21 21:59*	*1*
Dibromofluoromethane (Surr)	*121*		*78 - 129*		*02/22/21 21:59*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144509-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
190-25454-E-1 MS	Matrix Spike	79	97	95	83
190-25454-F-1 MSD	Matrix Spike Duplicate	84	95	95	86
240-144509-1	TRIP BLANK	83	96	99	87
240-144509-2	MW-149S_021121	113	65	78	126
240-144509-4	DUP-15	115	65	81	121
240-144518-G-2 MSD	Matrix Spike Duplicate	80	87	87	96
240-144518-H-2 MS	Matrix Spike	88	96	91	95
LCS 240-473958/4	Lab Control Sample	91	90	88	95
LCS 240-476776/4	Lab Control Sample	78	94	97	83
MB 240-473958/7	Method Blank	112	68	79	114
MB 240-476776/7	Method Blank	80	91	98	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144509-2	MW-149S_021121	83
240-144509-4	DUP-15	84
240-144515-J-3 MS	Matrix Spike	82
240-144515-J-3 MSD	Matrix Spike Duplicate	80
LCS 240-473720/4	Lab Control Sample	82
MB 240-473720/5	Method Blank	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473958/7
Matrix: Water
Analysis Batch: 473958

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 16:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 16:24	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 16:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 16:24	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 16:24	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/22/21 16:24	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*75 - 130*		*02/22/21 16:24*	*1*
4-Bromofluorobenzene (Surr)	*68*		*47 - 134*		*02/22/21 16:24*	*1*
Toluene-d8 (Surr)	*79*		*69 - 122*		*02/22/21 16:24*	*1*
Dibromofluoromethane (Surr)	*114*		*78 - 129*		*02/22/21 16:24*	*1*

Lab Sample ID: LCS 240-473958/4
Matrix: Water
Analysis Batch: 473958

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.9		ug/L		109	73 - 129
cis-1,2-Dichloroethene	10.0	10.0		ug/L		100	75 - 124
Tetrachloroethene	10.0	12.2		ug/L		122	70 - 125
trans-1,2-Dichloroethene	10.0	11.0		ug/L		110	74 - 130
Trichloroethene	10.0	10.1		ug/L		101	71 - 121
Vinyl chloride	10.0	9.31		ug/L		93	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*91*		*75 - 130*
4-Bromofluorobenzene (Surr)	*90*		*47 - 134*
Toluene-d8 (Surr)	*88*		*69 - 122*
Dibromofluoromethane (Surr)	*95*		*78 - 129*

Lab Sample ID: 240-144518-G-2 MSD
Matrix: Water
Analysis Batch: 473958

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.98		ug/L		100	64 - 132	3	35
cis-1,2-Dichloroethene	1.0	U	10.0	10.1		ug/L		101	68 - 121	7	35
Tetrachloroethene	1.0	U	10.0	10.7		ug/L		107	52 - 129	2	35
trans-1,2-Dichloroethene	1.0	U	10.0	10.2		ug/L		102	69 - 126	2	35
Trichloroethene	1.0	U	10.0	9.58		ug/L		96	56 - 124	1	35
Vinyl chloride	1.0	U	10.0	9.46		ug/L		95	49 - 136	3	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*80*		*75 - 130*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*
Toluene-d8 (Surr)	*87*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144518-G-2 MSD
Matrix: Water
Analysis Batch: 473958

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*96*		*78 - 129*

Lab Sample ID: 240-144518-H-2 MS
Matrix: Water
Analysis Batch: 473958

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.71		ug/L		97	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	9.40		ug/L		94	68 - 121
Tetrachloroethene	1.0	U	10.0	11.0		ug/L		110	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	69 - 126
Trichloroethene	1.0	U	10.0	9.67		ug/L		97	56 - 124
Vinyl chloride	1.0	U	10.0	9.16		ug/L		92	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 130*
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*
Toluene-d8 (Surr)	*91*		*69 - 122*
Dibromofluoromethane (Surr)	*95*		*78 - 129*

Lab Sample ID: MB 240-476776/7
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/15/21 15:40	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/15/21 15:40	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/15/21 15:40	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/15/21 15:40	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/15/21 15:40	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/15/21 15:40	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*75 - 130*		*03/15/21 15:40*	*1*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*		*03/15/21 15:40*	*1*
Toluene-d8 (Surr)	*98*		*69 - 122*		*03/15/21 15:40*	*1*
Dibromofluoromethane (Surr)	*81*		*78 - 129*		*03/15/21 15:40*	*1*

Lab Sample ID: LCS 240-476776/4
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.48		ug/L		85	73 - 129
cis-1,2-Dichloroethene	10.0	9.17		ug/L		92	75 - 124
Tetrachloroethene	10.0	10.2		ug/L		102	70 - 125
trans-1,2-Dichloroethene	10.0	8.93		ug/L		89	74 - 130
Trichloroethene	10.0	8.97		ug/L		90	71 - 121

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-476776/4
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Vinyl chloride			10.0	11.1		ug/L		111	61 - 134		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*78*		*75 - 130*
4-Bromofluorobenzene (Surr)	*94*		*47 - 134*
Toluene-d8 (Surr)	*97*		*69 - 122*
Dibromofluoromethane (Surr)	*83*		*78 - 129*

Lab Sample ID: 190-25454-E-1 MS
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,1-Dichloroethene	1.0	U	10.0	6.81		ug/L		68	64 - 132		
cis-1,2-Dichloroethene	1.0	U	10.0	7.96		ug/L		80	68 - 121		
Tetrachloroethene	1.0	U	10.0	8.88		ug/L		89	52 - 129		
trans-1,2-Dichloroethene	1.0	U	10.0	7.48		ug/L		75	69 - 126		
Trichloroethene	1.0	U	10.0	7.78		ug/L		78	56 - 124		
Vinyl chloride	1.0	U	10.0	9.92		ug/L		99	49 - 136		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*75 - 130*
4-Bromofluorobenzene (Surr)	*97*		*47 - 134*
Toluene-d8 (Surr)	*95*		*69 - 122*
Dibromofluoromethane (Surr)	*83*		*78 - 129*

Lab Sample ID: 190-25454-F-1 MSD
Matrix: Water
Analysis Batch: 476776

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	6.82		ug/L		68	64 - 132	0	35
cis-1,2-Dichloroethene	1.0	U	10.0	8.09		ug/L		81	68 - 121	2	35
Tetrachloroethene	1.0	U	10.0	8.78		ug/L		88	52 - 129	1	35
trans-1,2-Dichloroethene	1.0	U	10.0	7.87		ug/L		79	69 - 126	5	35
Trichloroethene	1.0	U	10.0	8.10		ug/L		81	56 - 124	4	35
Vinyl chloride	1.0	U	10.0	10.4		ug/L		104	49 - 136	4	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*95*		*69 - 122*
Dibromofluoromethane (Surr)	*86*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473720/5
Matrix: Water
Analysis Batch: 473720

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/19/21 11:08	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/19/21 11:08*	*1*

Lab Sample ID: LCS 240-473720/4
Matrix: Water
Analysis Batch: 473720

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	9.95		ug/L		100	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144515-J-3 MS
Matrix: Water
Analysis Batch: 473720

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	11.0		ug/L		110	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144515-J-3 MSD
Matrix: Water
Analysis Batch: 473720

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.6		ug/L		106	46 - 170	3	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144509-1

GC/MS VOA

Analysis Batch: 473720

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144509-2	MW-149S_021121	Total/NA	Water	8260B SIM	
240-144509-4	DUP-15	Total/NA	Water	8260B SIM	
MB 240-473720/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-473720/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144515-J-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144515-J-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 473958

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144509-2	MW-149S_021121	Total/NA	Water	8260B	
240-144509-4	DUP-15	Total/NA	Water	8260B	
MB 240-473958/7	Method Blank	Total/NA	Water	8260B	
LCS 240-473958/4	Lab Control Sample	Total/NA	Water	8260B	
240-144518-G-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	
240-144518-H-2 MS	Matrix Spike	Total/NA	Water	8260B	

Analysis Batch: 476776

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144509-1	TRIP BLANK	Total/NA	Water	8260B	
MB 240-476776/7	Method Blank	Total/NA	Water	8260B	
LCS 240-476776/4	Lab Control Sample	Total/NA	Water	8260B	
190-25454-E-1 MS	Matrix Spike	Total/NA	Water	8260B	
190-25454-F-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144509-1

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144509-1
Date Collected: 02/11/21 00:00
Matrix: Water
Date Received: 02/13/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	476776	03/15/21 18:10	LRW	TAL CAN

Client Sample ID: MW-149S_021121
Lab Sample ID: 240-144509-2
Date Collected: 02/11/21 12:10
Matrix: Water
Date Received: 02/13/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473958	02/22/21 22:22	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	473720	02/19/21 13:15	SAM	TAL CAN

Client Sample ID: DUP-15
Lab Sample ID: 240-144509-4
Date Collected: 02/11/21 00:00
Matrix: Water
Date Received: 02/13/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473958	02/22/21 21:59	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	473720	02/19/21 12:49	SAM	TAL CAN

Laboratory References:
TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144509-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

TestAmerica MICHIGAN 190

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No: 1 of 1 COCs
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day (3 weeks, 2 weeks, 1 week, 2 days, 1 day)	For lab use only: Walk-in client; Lab sampling; Job/SDG No:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ace / NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-149S_021121	2/11/21	1210		6						6					N	G	X	X	X	X	X	X	X	3 vocs for 8260B 3 vocs for 8260B SIM
DUP-15	2/11/21	—		6						6					N	G	X	X	X	X	X	X	X	+

240-144509 Chain of Custody

Possible Hazard Identification: Non-Hazard, Flammable, Skin Irritant, Poison B, Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client, Disposal By Lab, Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: Witherspoon	Arcadis	2/11/21 1700	Received by: Cold Storage	Arcadis	2/11/21 1700
Relinquished by:	Arcadis	2/12/2021	Received by: Amanda Battenfield	ETA	2/12/21 1005
Relinquished by: Amanda Battenfield	ETA	2/11/21 1101	Received in Laboratory by:	FedEx	2-13-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 144508**
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Ryan C

Cooler Received on 2-13-21 Opened on 2-13-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: ~~Bubble Wrap~~ Foam Plastic Bag None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.5 °C Corrected Cooler Temp. 1.6 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	~~Yes~~	No
-Were the seals on the outside of the cooler(s) signed & dated?	~~Yes~~	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	~~No~~
-Were tamper/custody seals intact and uncompromised?	~~Yes~~	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	~~No~~
4. Did custody papers accompany the sample(s)?	~~Yes~~	No
5. Were the custody papers relinquished & signed in the appropriate place?	~~Yes~~	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	~~Yes~~	No
7. Did all bottles arrive in good condition (Unbroken)?	~~Yes~~	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	~~Yes~~	No
9. For each sample, does the COC specify preservatives (~~Y~~/N), # of containers (~~Y~~/N), and sample type of grab/comp(~~Y~~/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	~~Yes~~	No
11. Sufficient quantity received to perform indicated analyses?	~~Yes~~	No
12. Are these work share samples and all listed on the COC?	Yes	~~No~~
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 59072	~~Yes~~	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

March 26, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144509-1
Sample date: 2021-02-11
Report received by CADENA: 2021-03-26
Initial Data Verification completed by CADENA: 2021-03-26
Number of Samples:3
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

HTQ - GCMS VOC sample TRIP BLANK analysis was performed outside of reference holding time due to an initial sample mix-up so all associated results should be considered to be estimated and qualified with UJ flags if non-detect.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Qualified Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144509-1

Sample Name: TRIP BLANK
Lab Sample ID: 2401445091
Sample Date: 2/11/2021

Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC					
OSW-8260B					
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	UJ
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	UJ
Tetrachloroethene	127-18-4	ND	1.0	ug/l	UJ
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	UJ
Trichloroethene	79-01-6	ND	1.0	ug/l	UJ
Vinyl chloride	75-01-4	ND	1.0	ug/l	UJ

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144509-1

		Sample Name:	TRIP BLANK				MW-149S_021121				DUP-15			
		Lab Sample ID:	2401445091				2401445092				2401445094			
		Sample Date:	2/11/2021				2/11/2021				2/11/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC													
OSW-8260B													
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	UJ	1.7	1.0	ug/l	---	1.7	1.0	ug/l	---
OSW-8260BBSim													
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

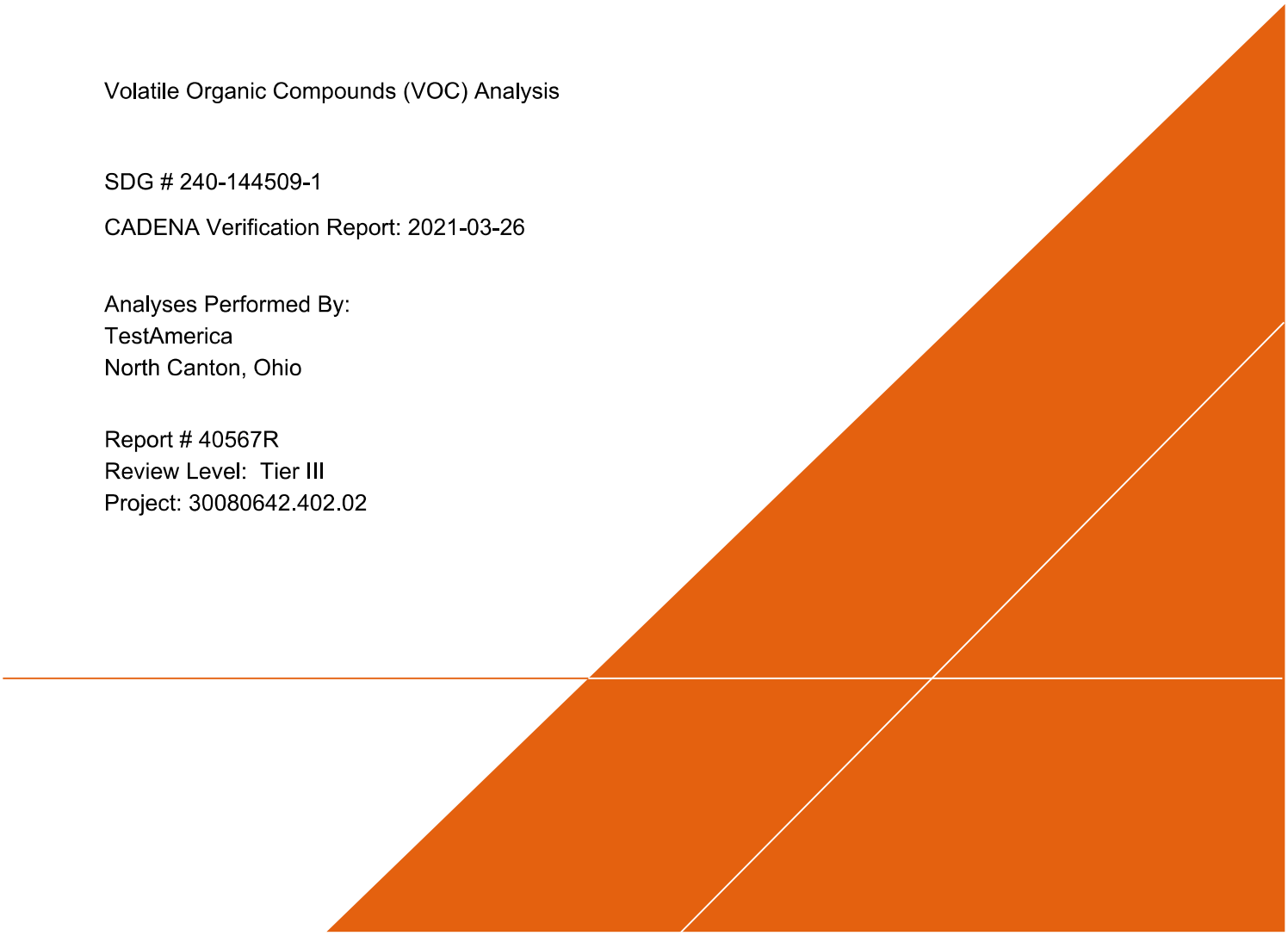
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144509-1

CADENA Verification Report: 2021-03-26

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40567R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144509-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144509-1	Water	02/11/2021		X	
MW-149S_021121	240-144509-2	Water	02/11/2021		X	X
DUP-15	240-144509-4	Water	02/11/2021	MW-149S_021121	X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

The analyses that exceeded the holding are presented in the following table.

Sample ID	Holding Time	Criteria
TRIP BLANK	32 days	14 days from collection to analysis

Sample results associated with samples mentioned in the table above, analyzed by analytical method SW-846 8260B were qualified, as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

DATA REVIEW

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result (µg/L)	Duplicate Result (µg/L)	RPD
MW-149S_021121 / DUP-15	Vinyl chloride	1.7	1.7	AC

Notes:

AC – Acceptable

The calculated differences between the parent sample and field duplicate were acceptable.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X	X		
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

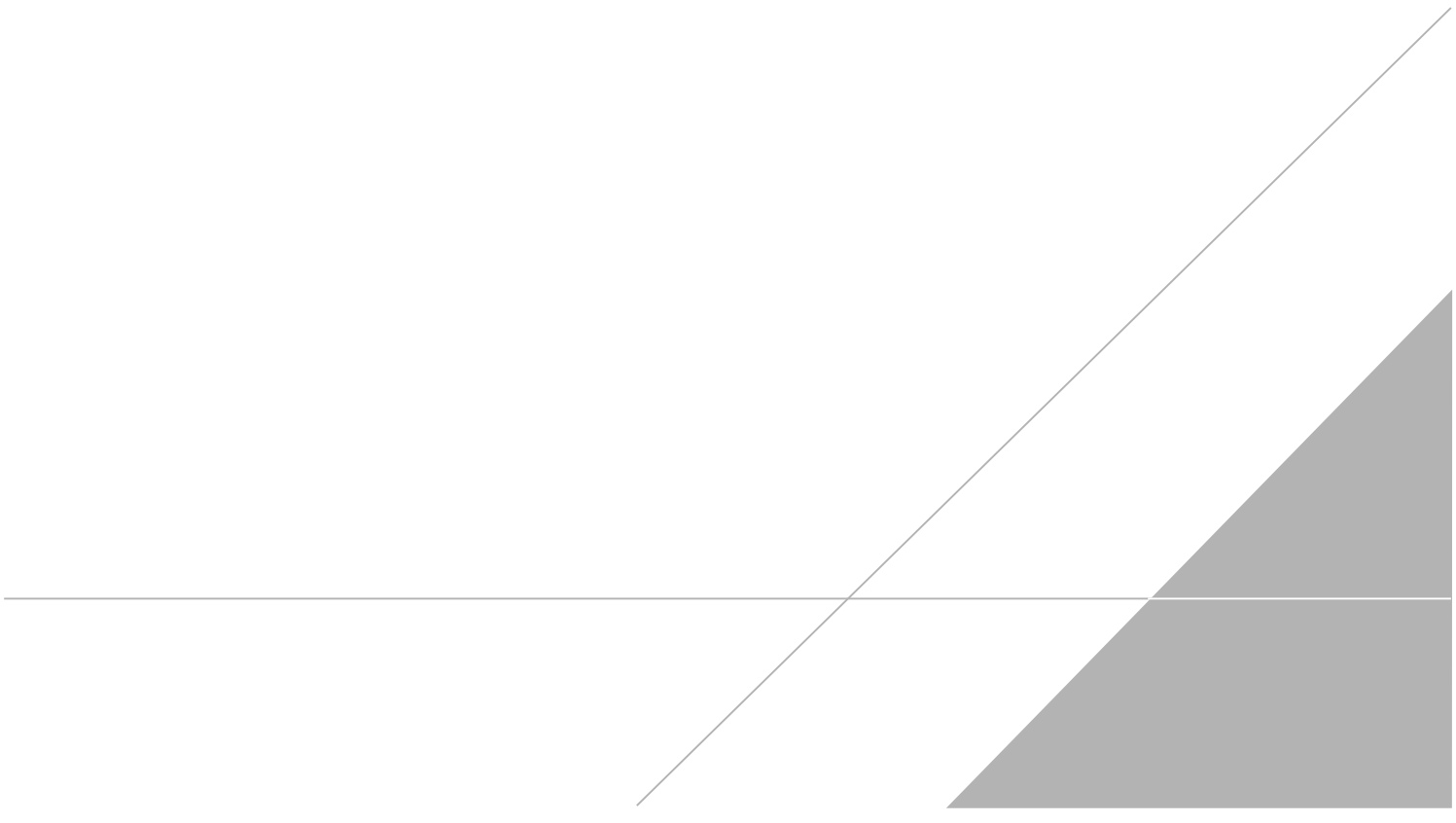
DATE: March 30, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 30, 2021

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190 TestAmerica

TestAmerica Laboratories, Inc.

Regulatory program: DW NPDES RCRA Other

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client; Lab sampling; Job/SDG No:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			
Project Number: 30050315.402.04	Shipping/Tracking No:			
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac / NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-149S_021121	2/11/21	1210		6						6					N	G	X	X	X	X	X	X	X	3 vials for 8260B 3 vials for 8260B SIM
DUP-15	2/11/21	—		6						6					N	G	X	X	X	X	X	X	X	+

240-144509 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Emma Witherspoon	Arcadis	2/11/21 1700	Cold Storage	Arcadis	2/11/21 1700
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[illegible]	Arcadis	2/12/2021	[illegible]	ETA	2/12/21 1005
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
[illegible]	ETA	2/11/21 11:01	[illegible]	ETA	2-13-21 900

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Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144509-1

Date Collected: 02/11/21 00:00
Matrix: Water
Date Received: 02/13/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
~~1,1-Dichloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.19~~	~~ug/L~~			~~03/15/21 18:10~~	R 1
~~cis-1,2-Dichloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.16~~	~~ug/L~~			~~03/15/21 18:10~~	R 1
~~Tetrachloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.15~~	~~ug/L~~			~~03/15/21 18:10~~	R 1
~~trans-1,2-Dichloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.19~~	~~ug/L~~			~~03/15/21 18:10~~	R 1
~~Trichloroethene~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.10~~	~~ug/L~~			~~03/15/21 18:10~~	R 1
~~Vinyl chloride~~	~~1.0~~	~~U H~~	~~1.0~~	~~0.20~~	~~ug/L~~			~~03/15/21 18:10~~	R 1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*75 - 130*		*03/15/21 18:10*	*1*
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*		*03/15/21 18:10*	*1*
Toluene-d8 (Surr)	*99*		*69 - 122*		*03/15/21 18:10*	*1*
Dibromofluoromethane (Surr)	*87*		*78 - 129*		*03/15/21 18:10*	*1*

Client Sample ID: MW-149S_021121

Lab Sample ID: 240-144509-2

Date Collected: 02/11/21 12:10
Matrix: Water
Date Received: 02/13/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/19/21 13:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/19/21 13:15*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 22:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 22:22	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 22:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 22:22	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 22:22	1
Vinyl chloride	**1.7**		1.0	0.20	ug/L			02/22/21 22:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*113*		*75 - 130*		*02/22/21 22:22*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*02/22/21 22:22*	*1*
Toluene-d8 (Surr)	*78*		*69 - 122*		*02/22/21 22:22*	*1*
Dibromofluoromethane (Surr)	*126*		*78 - 129*		*02/22/21 22:22*	*1*

Client Sample ID: DUP-15

Lab Sample ID: 240-144509-4

Date Collected: 02/11/21 00:00
Matrix: Water
Date Received: 02/13/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/19/21 12:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*		*02/19/21 12:49*	*1*

Client Sample ID: DUP-15
Date Collected: 02/11/21 00:00
Date Received: 02/13/21 08:00

Lab Sample ID: 240-144509-4
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 21:59	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 21:59	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 21:59	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 21:59	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 21:59	1
Vinyl chloride	**1.7**		1.0	0.20	ug/L			02/22/21 21:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*115*		*75 - 130*		*02/22/21 21:59*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*02/22/21 21:59*	*1*
Toluene-d8 (Surr)	*81*		*69 - 122*		*02/22/21 21:59*	*1*
Dibromofluoromethane (Surr)	*121*		*78 - 129*		*02/22/21 21:59*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144359-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
2/18/2021 2:51:57 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144359-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144359-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144359-1

Comments
No additional comments.

Receipt
The samples were received on 2/11/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.2° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144359-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144359-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144359-1	TRIP BLANK	Water	02/09/21 00:00	02/11/21 08:00	
240-144359-2	MW-169S_020921	Water	02/09/21 10:55	02/11/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144359-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144359-1

No Detections.

Client Sample ID: MW-169S_020921 — Lab Sample ID: 240-144359-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144359-1

Client Sample ID: TRIP BLANK
Date Collected: 02/09/21 00:00
Date Received: 02/11/21 08:00

Lab Sample ID: 240-144359-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/16/21 12:54	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/16/21 12:54	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/16/21 12:54	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/16/21 12:54	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/16/21 12:54	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/16/21 12:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*		*02/16/21 12:54*	*1*
4-Bromofluorobenzene (Surr)	*84*		*47 - 134*		*02/16/21 12:54*	*1*
Toluene-d8 (Surr)	*98*		*69 - 122*		*02/16/21 12:54*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*02/16/21 12:54*	*1*

Client Sample ID: MW-169S_020921
Date Collected: 02/09/21 10:55
Date Received: 02/11/21 08:00

Lab Sample ID: 240-144359-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 15:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/12/21 15:51*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 14:16	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 14:16	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 14:16	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 14:16	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 14:16	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 14:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*		*02/15/21 14:16*	*1*
4-Bromofluorobenzene (Surr)	*84*		*47 - 134*		*02/15/21 14:16*	*1*
Toluene-d8 (Surr)	*94*		*69 - 122*		*02/15/21 14:16*	*1*
Dibromofluoromethane (Surr)	*94*		*78 - 129*		*02/15/21 14:16*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144359-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144277-B-2 MS	Matrix Spike	91	95	105	99
240-144277-B-2 MSD	Matrix Spike Duplicate	93	90	99	99
240-144359-1	TRIP BLANK	93	84	98	98
240-144359-2	MW-169S_020921	93	84	94	94
240-144422-B-3 MS	Matrix Spike	97	101	105	100
240-144422-B-3 MSD	Matrix Spike Duplicate	94	95	103	100
LCS 240-473047/4	Lab Control Sample	99	102	106	104
LCS 240-473222/4	Lab Control Sample	104	108	112	112
MB 240-473047/6	Method Blank	86	81	92	93
MB 240-473222/6	Method Blank	89	83	90	89

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144359-2	MW-169S_020921	83
240-144376-F-3 MS	Matrix Spike	83
240-144376-F-3 MSD	Matrix Spike Duplicate	82
LCS 240-472900/4	Lab Control Sample	82
MB 240-472900/5	Method Blank	82

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473047/6
Matrix: Water
Analysis Batch: 473047

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 10:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 10:57	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 10:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 10:57	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 10:57	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 10:57	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*		*02/15/21 10:57*	*1*
4-Bromofluorobenzene (Surr)	*81*		*47 - 134*		*02/15/21 10:57*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*02/15/21 10:57*	*1*
Dibromofluoromethane (Surr)	*93*		*78 - 129*		*02/15/21 10:57*	*1*

Lab Sample ID: LCS 240-473047/4
Matrix: Water
Analysis Batch: 473047

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	11.1		ug/L		111	73 - 129
cis-1,2-Dichloroethene	10.0	10.6		ug/L		106	75 - 124
Tetrachloroethene	10.0	11.4		ug/L		114	70 - 125
trans-1,2-Dichloroethene	10.0	10.4		ug/L		104	74 - 130
Trichloroethene	10.0	10.4		ug/L		104	71 - 121
Vinyl chloride	10.0	9.92		ug/L		99	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*99*		*75 - 130*
4-Bromofluorobenzene (Surr)	*102*		*47 - 134*
Toluene-d8 (Surr)	*106*		*69 - 122*
Dibromofluoromethane (Surr)	*104*		*78 - 129*

Lab Sample ID: 240-144277-B-2 MS
Matrix: Water
Analysis Batch: 473047

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	67	U	667	598		ug/L		90	64 - 132
cis-1,2-Dichloroethene	1500		667	2140		ug/L		102	68 - 121
Tetrachloroethene	56	J	667	634		ug/L		87	52 - 129
Trichloroethene	1100		667	1670		ug/L		91	56 - 124
Vinyl chloride	160		667	734		ug/L		86	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*91*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*105*		*69 - 122*
Dibromofluoromethane (Surr)	*99*		*78 - 129*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144277-B-2 MSD
Matrix: Water
Analysis Batch: 473047

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	67	U	667	668		ug/L		100	64 - 132	11	35
cis-1,2-Dichloroethene	1500		667	2220		ug/L		113	68 - 121	3	35
Tetrachloroethene	56	J	667	730		ug/L		101	52 - 129	14	35
Trichloroethene	1100		667	1740		ug/L		101	56 - 124	4	35
Vinyl chloride	160		667	774		ug/L		92	49 - 136	5	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*90*		*47 - 134*
Toluene-d8 (Surr)	*99*		*69 - 122*
Dibromofluoromethane (Surr)	*99*		*78 - 129*

Lab Sample ID: MB 240-473222/6
Matrix: Water
Analysis Batch: 473222

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/16/21 11:47	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/16/21 11:47	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/16/21 11:47	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/16/21 11:47	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/16/21 11:47	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/16/21 11:47	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*75 - 130*		*02/16/21 11:47*	*1*
4-Bromofluorobenzene (Surr)	*83*		*47 - 134*		*02/16/21 11:47*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*02/16/21 11:47*	*1*
Dibromofluoromethane (Surr)	*89*		*78 - 129*		*02/16/21 11:47*	*1*

Lab Sample ID: LCS 240-473222/4
Matrix: Water
Analysis Batch: 473222

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.9		ug/L		109	73 - 129
cis-1,2-Dichloroethene	10.0	11.0		ug/L		110	75 - 124
Tetrachloroethene	10.0	11.4		ug/L		114	70 - 125
trans-1,2-Dichloroethene	10.0	11.3		ug/L		113	74 - 130
Trichloroethene	10.0	11.2		ug/L		112	71 - 121
Vinyl chloride	10.0	10.4		ug/L		104	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*
4-Bromofluorobenzene (Surr)	*108*		*47 - 134*
Toluene-d8 (Surr)	*112*		*69 - 122*
Dibromofluoromethane (Surr)	*112*		*78 - 129*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144422-B-3 MS
Matrix: Water
Analysis Batch: 473222

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*
4-Bromofluorobenzene (Surr)	*101*		*47 - 134*
Toluene-d8 (Surr)	*105*		*69 - 122*
Dibromofluoromethane (Surr)	*100*		*78 - 129*

Lab Sample ID: 240-144422-B-3 MSD
Matrix: Water
Analysis Batch: 473222

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*94*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*103*		*69 - 122*
Dibromofluoromethane (Surr)	*100*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-472900/5
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 12:29	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/12/21 12:29*	*1*

Lab Sample ID: LCS 240-472900/4
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.6		ug/L		106	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144376-F-3 MS
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	10.8		ug/L		108	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144376-F-3 MSD
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.8		ug/L		108	46 - 170	1	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144359-1

GC/MS VOA

Analysis Batch: 472900

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144359-2	MW-169S_020921	Total/NA	Water	8260B SIM	
MB 240-472900/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-472900/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144376-F-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144376-F-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 473047

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144359-2	MW-169S_020921	Total/NA	Water	8260B	
MB 240-473047/6	Method Blank	Total/NA	Water	8260B	
LCS 240-473047/4	Lab Control Sample	Total/NA	Water	8260B	
240-144277-B-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144277-B-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 473222

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144359-1	TRIP BLANK	Total/NA	Water	8260B	
MB 240-473222/6	Method Blank	Total/NA	Water	8260B	
LCS 240-473222/4	Lab Control Sample	Total/NA	Water	8260B	
240-144422-B-3 MS	Matrix Spike	Total/NA	Water	8260B	
240-144422-B-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144359-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144359-1

Date Collected: 02/09/21 00:00
Matrix: Water
Date Received: 02/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473222	02/16/21 12:54	LEE	TAL CAN

Client Sample ID: MW-169S_020921

Lab Sample ID: 240-144359-2

Date Collected: 02/09/21 10:55
Matrix: Water
Date Received: 02/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473047	02/15/21 14:16	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	472900	02/12/21 15:51	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144359-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

MICHIGAN 190 TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client:
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 TRIP blank
INW-1695-020921	2/9/21	1055		6						6					N	G	X	X	X	X	X	X	X	3 vials for 8260B 3 vials for 8260B SIM

240-144359 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalla@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
E Witherspoon	Arcadis	2/9/21 1700	Novi cold storage	Arcadis	2/9/21 1700
Julia McClafferty	Arcadis	2/10/2021	Amanda Battenhill	ETA	2/10/21 10:12
Amanda Battenhill	ETA	2/10/21 1309	Received in Laboratory by:	Company:	Date/Time:
				ETA	2-11-21 800

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2/18/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative Login # : 144359
Canton Facility

Client Arcadis Site Name

Cooler unpacked by: Matsmyer

Cooler Received on 2-11-21 Opened on 2-11-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: ~~Bubble Wrap~~ Foam Plastic Bag None Other

COOLANT: ~~Wet Ice~~ Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2.1 °C Corrected Cooler Temp. 2.2 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	(Yes)	No
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?	(Y)	(N)
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No	(NA) pH Strip Lot# HC907861
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 030310F	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present?	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by: Ryan C.

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container.
Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.
Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

DATA VERIFICATION REPORT

February 18, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144359-1
Sample date: 2021-02-09
Report received by CADENA: 2021-02-18
Initial Data Verification completed by CADENA: 2021-02-18
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144359-1

		Sample Name:	TRIP BLANK				MW-169S_020921			
		Lab Sample ID:	2401443591				2401443592			
		Sample Date:	2/9/2021				2/9/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS Design & Consultancy for natural and built assets

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

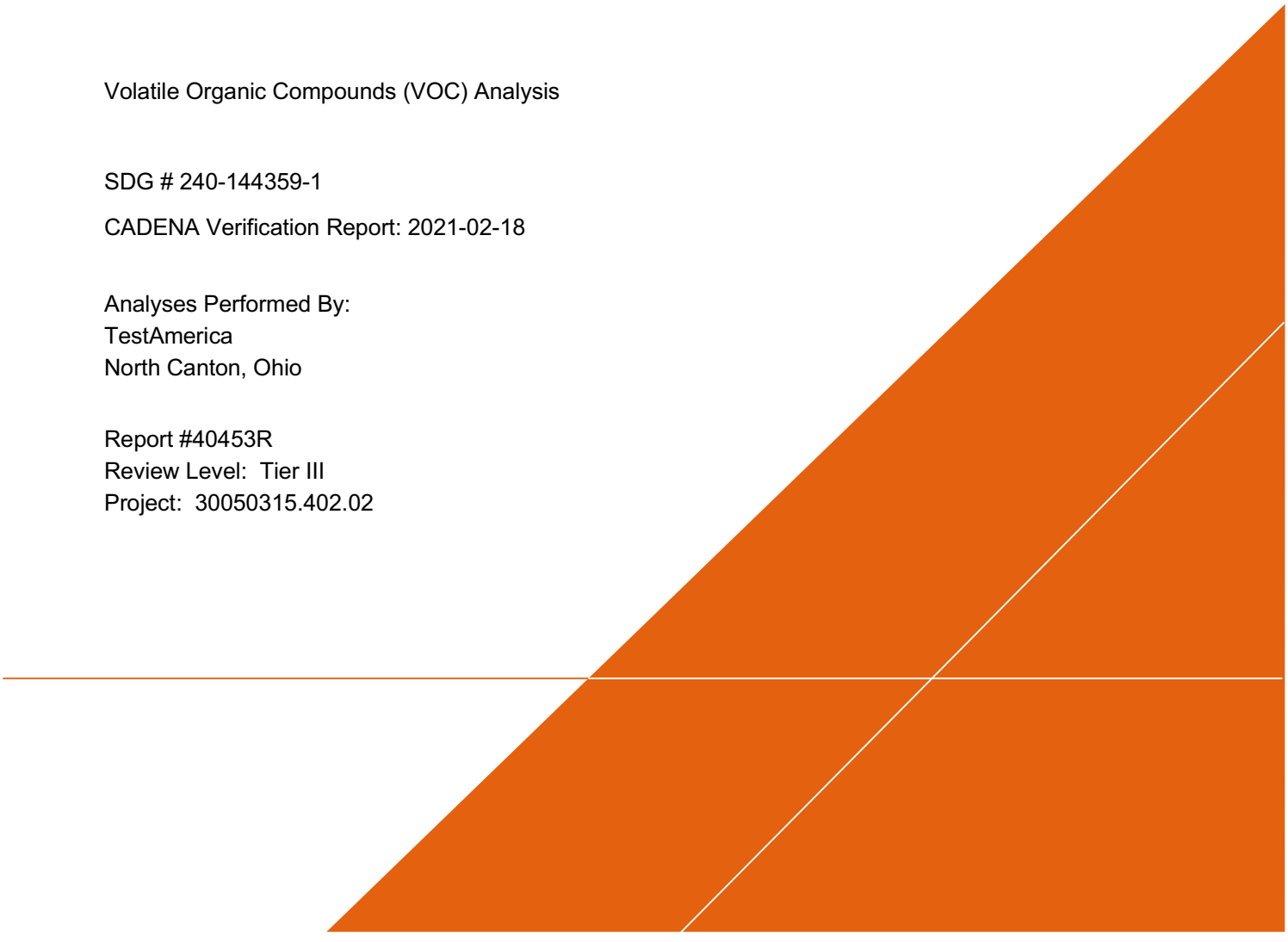
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144359-1

CADENA Verification Report: 2021-02-18

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report #40453R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144359-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					VOC
TRIP BLANK	240-144359-1	Water	02/09/2021		X
MW-169S_020921	240-144359-2	Water	02/09/2021		X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Prashanth K

SIGNATURE: 

DATE: March 08, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 10, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190 — TestAmerica — THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	☐ DW ☐ NPDES ☐ RCRA ☐ Other	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of 1 COCs
Address: 28550 Cabot Drive, Suite 500		Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377		Sampler Name: Emma Witherspoon	TAT if different from below ☐ 10 day ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client
Phone: 248-994-2240		Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site		Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04					
PO # 30050315.402.04					

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM				Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		X						X					N	G	X	X	X	X	X	X	X				1 TRIP blank
INW-169S_020921	2/9/21	1055		6						6					N	G	X	X	X	X	X	X	X				3 vials for 8260B 3 vials for 8260B SIM

240-144359 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalla@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
E Witherspoon	Arcadis	2/9/21 1700	Novi cold storage	Arcadis	2/9/21 1700
Julia McClafferty	Arcadis	2/10/2021	Amanda Battershell	ETA	2/10/21 10:12
Amanda Battershell	ETA	2/10/21 1309	Received in Laboratory by:	Company:	Date/Time: 2-11-21 800

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02/18/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144359-1

Date Collected: 02/09/21 00:00
Matrix: Water
Date Received: 02/11/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/16/21 12:54	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/16/21 12:54	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/16/21 12:54	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/16/21 12:54	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/16/21 12:54	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/16/21 12:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*		*02/16/21 12:54*	*1*
4-Bromofluorobenzene (Surr)	*84*		*47 - 134*		*02/16/21 12:54*	*1*
Toluene-d8 (Surr)	*98*		*69 - 122*		*02/16/21 12:54*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*02/16/21 12:54*	*1*

Client Sample ID: MW-169S_020921
Lab Sample ID: 240-144359-2

Date Collected: 02/09/21 10:55
Matrix: Water
Date Received: 02/11/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 15:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/12/21 15:51*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 14:16	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 14:16	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 14:16	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 14:16	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 14:16	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 14:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*		*02/15/21 14:16*	*1*
4-Bromofluorobenzene (Surr)	*84*		*47 - 134*		*02/15/21 14:16*	*1*
Toluene-d8 (Surr)	*94*		*69 - 122*		*02/15/21 14:16*	*1*
Dibromofluoromethane (Surr)	*94*		*78 - 129*		*02/15/21 14:16*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144433-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
2/24/2021 11:21:02 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
F1	MS and/or MSD recovery exceeds control limits.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144433-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144433-1

Comments
No additional comments.

Receipt
The samples were received on 2/12/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.4° C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) associated with batch 473378 recovered above the upper control limit for 1,1-Dichloroethene. The samples associated with this CCV were non-detect for the affected analyte; therefore, the data have been reported. The associated samples are impacted: TRIP BLANK (240-144433-1) and MW-168S_021021 (240-144433-2).

Method 8260B: The laboratory control sample (LCS) for 473378 recovered outside control limits for the following analyte: 1,1-Dichloroethene. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported: TRIP BLANK (240-144433-1), MW-168S_021021 (240-144433-2) and (LCS 240-473378/4).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144433-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144433-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144433-1	TRIP BLANK	Water	02/10/21 00:00	02/12/21 08:00	
240-144433-2	MW-168S_021021	Water	02/10/21 15:10	02/12/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144433-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144433-1

No Detections.

Client Sample ID: MW-168S_021021 — Lab Sample ID: 240-144433-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144433-1

Client Sample ID: TRIP BLANK
Date Collected: 02/10/21 00:00
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144433-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/17/21 17:40	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 17:40	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 17:40	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 17:40	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 17:40	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 17:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*123*		*75 - 130*		*02/17/21 17:40*	*1*
4-Bromofluorobenzene (Surr)	*80*		*47 - 134*		*02/17/21 17:40*	*1*
Toluene-d8 (Surr)	*86*		*69 - 122*		*02/17/21 17:40*	*1*
Dibromofluoromethane (Surr)	*109*		*78 - 129*		*02/17/21 17:40*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144433-1

Client Sample ID: MW-168S_021021

Date Collected: 02/10/21 15:10
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144433-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 20:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*		*02/18/21 20:01*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U F1 *+	1.0	0.19	ug/L			02/17/21 18:02	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 18:02	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 18:02	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 18:02	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 18:02	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 18:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*127*		*75 - 130*		*02/17/21 18:02*	*1*
4-Bromofluorobenzene (Surr)	*80*		*47 - 134*		*02/17/21 18:02*	*1*
Toluene-d8 (Surr)	*88*		*69 - 122*		*02/17/21 18:02*	*1*
Dibromofluoromethane (Surr)	*110*		*78 - 129*		*02/17/21 18:02*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144433-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144433-1	TRIP BLANK	123	80	86	109
240-144433-2	MW-168S_021021	127	80	88	110
240-144433-2 MS	MW-168S_021021	108	108	96	96
240-144433-2 MSD	MW-168S_021021	106	108	97	96
LCS 240-473378/4	Lab Control Sample	108	109	99	98
MB 240-473378/7	Method Blank	112	88	88	96

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144425-C-2 MS	Matrix Spike	82
240-144425-C-2 MSD	Matrix Spike Duplicate	81
240-144433-2	MW-168S_021021	79
LCS 240-473604/4	Lab Control Sample	81
MB 240-473604/5	Method Blank	80

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473378/7
Matrix: Water
Analysis Batch: 473378

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 10:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 10:46	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 10:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 10:46	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 10:46	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 10:46	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*75 - 130*		*02/17/21 10:46*	*1*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*		*02/17/21 10:46*	*1*
Toluene-d8 (Surr)	*88*		*69 - 122*		*02/17/21 10:46*	*1*
Dibromofluoromethane (Surr)	*96*		*78 - 129*		*02/17/21 10:46*	*1*

Lab Sample ID: LCS 240-473378/4
Matrix: Water
Analysis Batch: 473378

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	15.6	*+	ug/L		156	73 - 129
cis-1,2-Dichloroethene	10.0	9.70		ug/L		97	75 - 124
Tetrachloroethene	10.0	9.82		ug/L		98	70 - 125
trans-1,2-Dichloroethene	10.0	9.77		ug/L		98	74 - 130
Trichloroethene	10.0	9.22		ug/L		92	71 - 121
Vinyl chloride	10.0	7.79		ug/L		78	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*108*		*75 - 130*
4-Bromofluorobenzene (Surr)	*109*		*47 - 134*
Toluene-d8 (Surr)	*99*		*69 - 122*
Dibromofluoromethane (Surr)	*98*		*78 - 129*

Lab Sample ID: 240-144433-2 MS
Matrix: Water
Analysis Batch: 473378

Client Sample ID: MW-168S_021021
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U F1 *+	10.0	16.4	F1	ug/L		164	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	8.88		ug/L		89	68 - 121
Tetrachloroethene	1.0	U	10.0	8.79		ug/L		88	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	8.74		ug/L		87	69 - 126
Trichloroethene	1.0	U	10.0	8.38		ug/L		84	56 - 124
Vinyl chloride	1.0	U	10.0	6.85		ug/L		69	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*108*		*75 - 130*
4-Bromofluorobenzene (Surr)	*108*		*47 - 134*
Toluene-d8 (Surr)	*96*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144433-2 MS
Matrix: Water
Analysis Batch: 473378

Client Sample ID: MW-168S_021021
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*96*		*78 - 129*

Lab Sample ID: 240-144433-2 MSD
Matrix: Water
Analysis Batch: 473378

Client Sample ID: MW-168S_021021
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U F1 *+	10.0	13.8	F1	ug/L		138	64 - 132	18	35
cis-1,2-Dichloroethene	1.0	U	10.0	8.85		ug/L		89	68 - 121	0	35
Tetrachloroethene	1.0	U	10.0	8.74		ug/L		87	52 - 129	1	35
trans-1,2-Dichloroethene	1.0	U	10.0	8.79		ug/L		88	69 - 126	1	35
Trichloroethene	1.0	U	10.0	8.35		ug/L		83	56 - 124	0	35
Vinyl chloride	1.0	U	10.0	6.56		ug/L		66	49 - 136	4	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*106*		*75 - 130*
4-Bromofluorobenzene (Surr)	*108*		*47 - 134*
Toluene-d8 (Surr)	*97*		*69 - 122*
Dibromofluoromethane (Surr)	*96*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473604/5
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 12:27	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/18/21 12:27*	*1*

Lab Sample ID: LCS 240-473604/4
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.5		ug/L		105	80 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

Lab Sample ID: 240-144425-C-2 MS
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	11.1		ug/L		111	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144425-C-2 MSD
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.7		ug/L		107	46 - 170	3	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144433-1

GC/MS VOA

Analysis Batch: 473378

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144433-1	TRIP BLANK	Total/NA	Water	8260B	
240-144433-2	MW-168S_021021	Total/NA	Water	8260B	
MB 240-473378/7	Method Blank	Total/NA	Water	8260B	
LCS 240-473378/4	Lab Control Sample	Total/NA	Water	8260B	
240-144433-2 MS	MW-168S_021021	Total/NA	Water	8260B	
240-144433-2 MSD	MW-168S_021021	Total/NA	Water	8260B	

Analysis Batch: 473604

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144433-2	MW-168S_021021	Total/NA	Water	8260B SIM	
MB 240-473604/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-473604/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144425-C-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144425-C-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144433-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144433-1

Date Collected: 02/10/21 00:00

Matrix: Water

Date Received: 02/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473378	02/17/21 17:40	LEE	TAL CAN

Client Sample ID: MW-168S_021021

Lab Sample ID: 240-144433-2

Date Collected: 02/10/21 15:10

Matrix: Water

Date Received: 02/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473378	02/17/21 18:02	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	473604	02/18/21 20:01	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144433-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190

TestAmerica

Client Contact	Regulatory program: DW NPDES RCRA Other		TestAmerica Laboratories, Inc.
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		COC No:
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	Analysis Turnaround Time	1 of 1 COCs
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:	TAT if different from below: 10 day; 3 weeks; 2 weeks; 1 week; 2 days; 1 day	For lab use only
Project Number: 30050315.402.04	Shipping/Tracking No:		Walk-in client
PO # 30050315.402.04			Lab sampling
			Job/SDG No:

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 TRIP BLANK
MW-168S_021021	2/10/21	1510		6						6					N	G	X	X	X	X	X	X	X	3 VOAS for 8260B 3 VOAS for 8260B SIM

240-144433 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; ✓ Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
E Witherspoon	Arcadis	2/10/21 / 1700	Novi Cold Storage	Arcadis	2/10/21 / 1700
[signature]	ARCADIS	2/11/21 / 0953	[signature]	ETA	2/11/21 / 0953
			Received in Laboratory by: [signature]	ETA	2-12-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative Login # : 144433
Canton Facility

Client Arcadis Site Name

Cooler Received on 2-12-21 Opened on 2-12-21 800

Cooler unpacked by: Ryan C

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☑ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 0.3 °C Corrected Cooler Temp. 0.4 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 3	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No RAC 2.12.21
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 59072	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

February 24, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144433-1
Sample date: 2021-02-10
Report received by CADENA: 2021-02-24
Initial Data Verification completed by CADENA: 2021-02-24
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 473378 LCS recoveries were outliers biased high for the following analyte: 1,1-DICHLOROETHENE. Associated client sample results were non-detect so qualification was not required based on this high bias QC outlier.

GCMS VOC sample -002 MS/MSD recoveries were outliers biased high for the following analyte: 1,1-DICHLOROETHENE. Associated client sample results were non-detect so qualification was not required based on these high bias QC outliers.

GCMS VOC QC batch CCV response outliers as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, MS/MSD Recovery, MS/MSD RPD, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144433-1

		Sample Name:	TRIP BLANK				MW-168S_021021			
		Lab Sample ID:	2401444331				2401444332			
		Sample Date:	2/10/2021				2/10/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

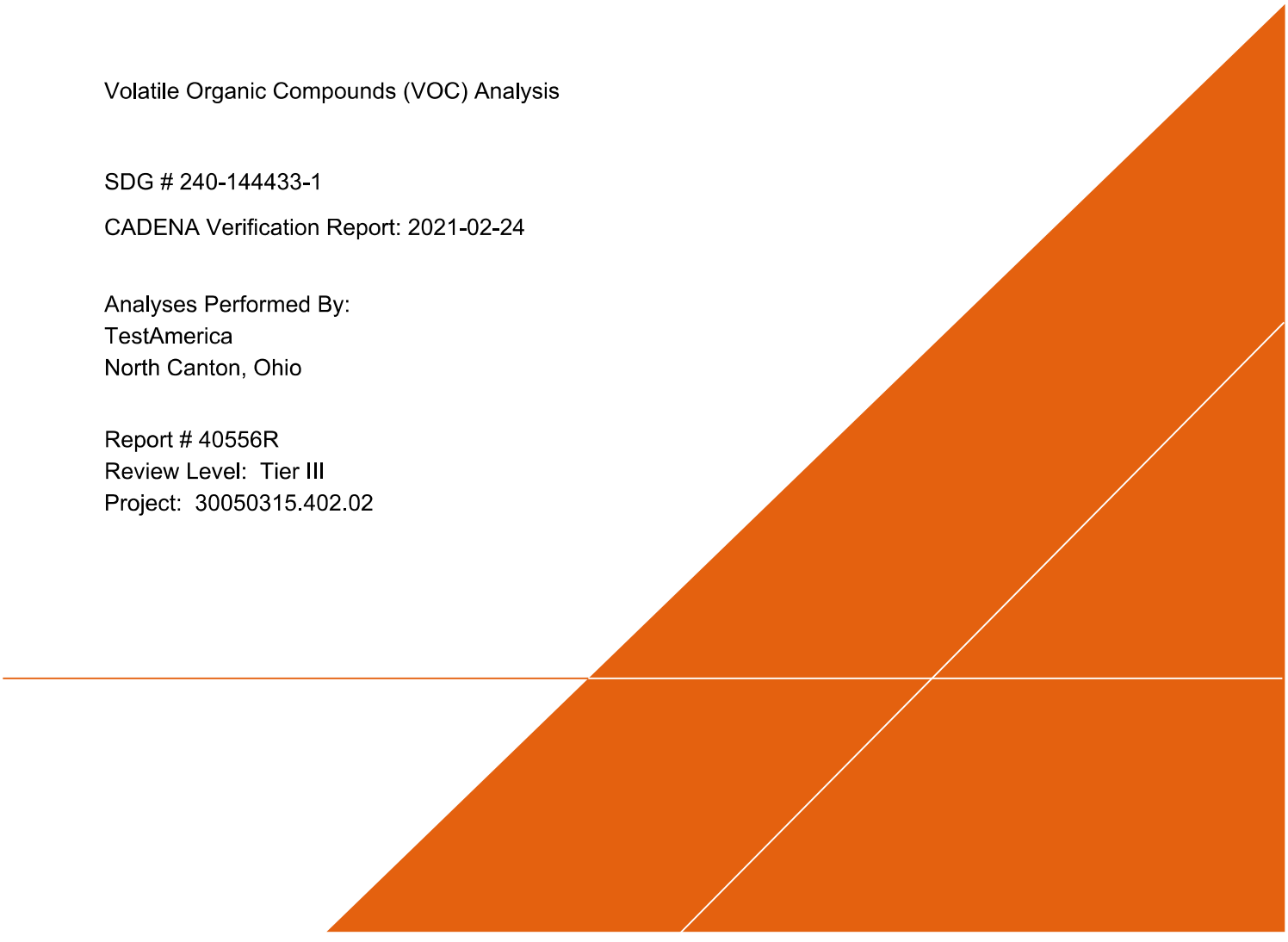
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144433-1

CADENA Verification Report: 2021-02-24

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40556R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144433-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144433-1	Water	02/10/2021		X	
MW-168S_021021	240-144433-2	Water	02/10/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial/Continuing	Compound	Criteria
TRIP BLANK MW-168S_021021	CCV %D	1,1-Dichloroethene	+49.0%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J

Initial/Continuing	Criteria	Sample Result	Qualification
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1] RRF of 0.01 only applies to compounds which are typically poor responding compounds (i.e., ketones, 1,4-dioxane, etc.)

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 17, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190 TestAmerica

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No: ___ of ___ COCs
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day	For lab use only: Walk-in client; Lab sampling; Job/SDG No:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	! TRIP BLANK
MW-168S_021021	2/10/21	1510		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-144433 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: Ewitherspoon	Arcadis	2/10/21 1700	Received by: Novi old storage	Arcadis	2/10/21 1700
Relinquished by:	Arcadis	2/11/21 0953	Received by:	ETA	2/11/21 0953
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company: ETA	Date/Time: 2-12-21 800

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144433-1
Date Collected: 02/10/21 00:00
Matrix: Water
Date Received: 02/12/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/17/21 17:40	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 17:40	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 17:40	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 17:40	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 17:40	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 17:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*123*		*75 - 130*		*02/17/21 17:40*	*1*
4-Bromofluorobenzene (Surr)	*80*		*47 - 134*		*02/17/21 17:40*	*1*
Toluene-d8 (Surr)	*86*		*69 - 122*		*02/17/21 17:40*	*1*
Dibromofluoromethane (Surr)	*109*		*78 - 129*		*02/17/21 17:40*	*1*

Client Sample ID: MW-168S_021021
Lab Sample ID: 240-144433-2
Date Collected: 02/10/21 15:10
Matrix: Water
Date Received: 02/12/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 20:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*		*02/18/21 20:01*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U F1 *+	1.0	0.19	ug/L			02/17/21 18:02	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 18:02	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 18:02	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 18:02	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 18:02	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 18:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*127*		*75 - 130*		*02/17/21 18:02*	*1*
4-Bromofluorobenzene (Surr)	*80*		*47 - 134*		*02/17/21 18:02*	*1*
Toluene-d8 (Surr)	*88*		*69 - 122*		*02/17/21 18:02*	*1*
Dibromofluoromethane (Surr)	*110*		*78 - 129*		*02/17/21 18:02*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-145069-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/12/2021 4:22:55 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145069-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-145069-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-145069-1

Comments
No additional comments.

Receipt
The samples were received on 2/26/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.7º C.

GC/MS VOA
Method 8260B: The matrix spike/matrix spike duplicate (MS/MSD) for samples TRIP BLANK (240-145069-1) and MW-152S_022421 (240-145069-2) was not reported, because the analyte list for these samples did not match the analyte list for the MS/MSD parent sample.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145069-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145069-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-145069-1	TRIP BLANK	Water	02/24/21 00:00	02/26/21 08:00	
240-145069-2	MW-152S_022421	Water	02/24/21 16:00	02/26/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145069-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-145069-1

No Detections.

Client Sample ID: MW-152S_022421 — Lab Sample ID: 240-145069-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145069-1

Client Sample ID: TRIP BLANK

Date Collected: 02/24/21 00:00
Date Received: 02/26/21 08:00

Lab Sample ID: 240-145069-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 23:42	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 23:42	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 23:42	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 23:42	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 23:42	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 23:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 130*		*03/02/21 23:42*	*1*
4-Bromofluorobenzene (Surr)	*97*		*47 - 134*		*03/02/21 23:42*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*03/02/21 23:42*	*1*
Dibromofluoromethane (Surr)	*85*		*78 - 129*		*03/02/21 23:42*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145069-1

Client Sample ID: MW-152S_022421
Date Collected: 02/24/21 16:00
Date Received: 02/26/21 08:00

Lab Sample ID: 240-145069-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 18:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*70 - 133*		*03/01/21 18:54*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 00:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 00:07	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 00:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 00:07	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 00:07	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 00:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*		*03/03/21 00:07*	*1*
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*		*03/03/21 00:07*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*03/03/21 00:07*	*1*
Dibromofluoromethane (Surr)	*85*		*78 - 129*		*03/03/21 00:07*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145069-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-145069-1	TRIP BLANK	87	97	93	85
240-145069-2	MW-152S_022421	86	96	93	85
LCS 240-475068/4	Lab Control Sample	86	99	94	87
MB 240-475068/7	Method Blank	85	100	97	87

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144807-J-4 MS	Matrix Spike	90
240-144807-J-4 MSD	Matrix Spike Duplicate	88
240-145069-2	MW-152S_022421	93
LCS 240-474842/4	Lab Control Sample	90
MB 240-474842/5	Method Blank	86

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475068/7
Matrix: Water
Analysis Batch: 475068

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 14:58	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 14:58	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 14:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 14:58	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 14:58	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 14:58	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*75 - 130*		*03/02/21 14:58*	*1*
4-Bromofluorobenzene (Surr)	*100*		*47 - 134*		*03/02/21 14:58*	*1*
Toluene-d8 (Surr)	*97*		*69 - 122*		*03/02/21 14:58*	*1*
Dibromofluoromethane (Surr)	*87*		*78 - 129*		*03/02/21 14:58*	*1*

Lab Sample ID: LCS 240-475068/4
Matrix: Water
Analysis Batch: 475068

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.17		ug/L		92	73 - 129
cis-1,2-Dichloroethene	10.0	9.13		ug/L		91	75 - 124
Tetrachloroethene	10.0	9.70		ug/L		97	70 - 125
trans-1,2-Dichloroethene	10.0	9.16		ug/L		92	74 - 130
Trichloroethene	10.0	9.16		ug/L		92	71 - 121
Vinyl chloride	10.0	10.9		ug/L		109	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*
4-Bromofluorobenzene (Surr)	*99*		*47 - 134*
Toluene-d8 (Surr)	*94*		*69 - 122*
Dibromofluoromethane (Surr)	*87*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474842/5
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 12:12	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*		*03/01/21 12:12*	*1*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-474842/4
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	9.05		ug/L		91	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*70 - 133*

Lab Sample ID: 240-144807-J-4 MS
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	8.95		ug/L		90	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*70 - 133*

Lab Sample ID: 240-144807-J-4 MSD
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.28		ug/L		93	46 - 170	4	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145069-1

GC/MS VOA

Analysis Batch: 474842

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-145069-2	MW-152S_022421	Total/NA	Water	8260B SIM	
MB 240-474842/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474842/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144807-J-4 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144807-J-4 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 475068

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-145069-1	TRIP BLANK	Total/NA	Water	8260B	
240-145069-2	MW-152S_022421	Total/NA	Water	8260B	
MB 240-475068/7	Method Blank	Total/NA	Water	8260B	
LCS 240-475068/4	Lab Control Sample	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145069-1

Client Sample ID: TRIP BLANK
Date Collected: 02/24/21 00:00
Date Received: 02/26/21 08:00

Lab Sample ID: 240-145069-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475068	03/02/21 23:42	LRW	TAL CAN

Client Sample ID: MW-152S_022421
Date Collected: 02/24/21 16:00
Date Received: 02/26/21 08:00

Lab Sample ID: 240-145069-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475068	03/03/21 00:07	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474842	03/01/21 18:54	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145069-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

12/1-2

Chain of Custody Record

TestAmerica MICHIGAN 190

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Site Contact	Lab Contact	COC No:
Company Name: Arcadis	☐ DW ☐ NPDES ☐ RCRA ☐ Other	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	
Address: 28550 Cabot Drive, Suite 500	Client Project Manager: Kris Hinskey	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
City/State/Zip: Novi, MI, 48377	Telephone: 248-994-2240			For lab use only
Phone: 248-994-2240	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		Walk-in client
Project Name: Ford LTP Off-Site	Sampler Name: EMMA Witherspoon	TAT if different from below: ☐ 3 weeks ☑ 10 day ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Lab sampling
Project Number: 30050315.402.04	Method of Shipment/Carrier:			Job/SDG No:
PO # 30050315.402.04	Shipping/Tracking No:			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 TRIP BLANK
MW-15S_022421	2/24/21	1600		G						G					N	G	X	X	X	X	X	X	X	-3 vials for 8260B -3 vials for 8260B SIM

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Witherspoon	Arcadis	2/24/21 1700	Novi cold storage	Arcadis	2/24/21 1700
Julia McClafferty	Arcadis	2/25/2021	Amanda Battenhill	ETA	2/25/21 10:03
Amanda Battenhill	ETA	2/25/21 1238	Received in Laboratory by: MJS ETA CANTON	Company: FEB 26 2021	Date/Time: 800

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3/12/2021

240-145069 Chain of Custody

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 440-
Canton Facility

Client Arcadis Site Name

Cooler Received on FEB 26 2021 Opened on FEB 26 2021

Cooler unpacked by: MJS ETA CANTON

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # NA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam (Plastic Bag) None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.6 °C Corrected Cooler Temp. 1.7 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)? (Y) (Y) (Y)
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # NA (Yes) No
17. Was a LL Hg or Me Hg trip blank present? ____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by: MJS ETA CANTON

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT



March 12, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 145069-1
Sample date: 2021-02-24
Report received by CADENA: 2021-03-12
Initial Data Verification completed by CADENA: 2021-03-12
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

The matrix spike/matrix spike duplicate (MS/MSD) analytes were not reported, because the analyte list for these samples did not match the analyte list for the MS/MSD parent sample.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 145069-1

		Sample Name:	TRIP BLANK				MW-152S_022421			
		Lab Sample ID:	2401450691				2401450692			
		Sample Date:	2/24/2021				2/24/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

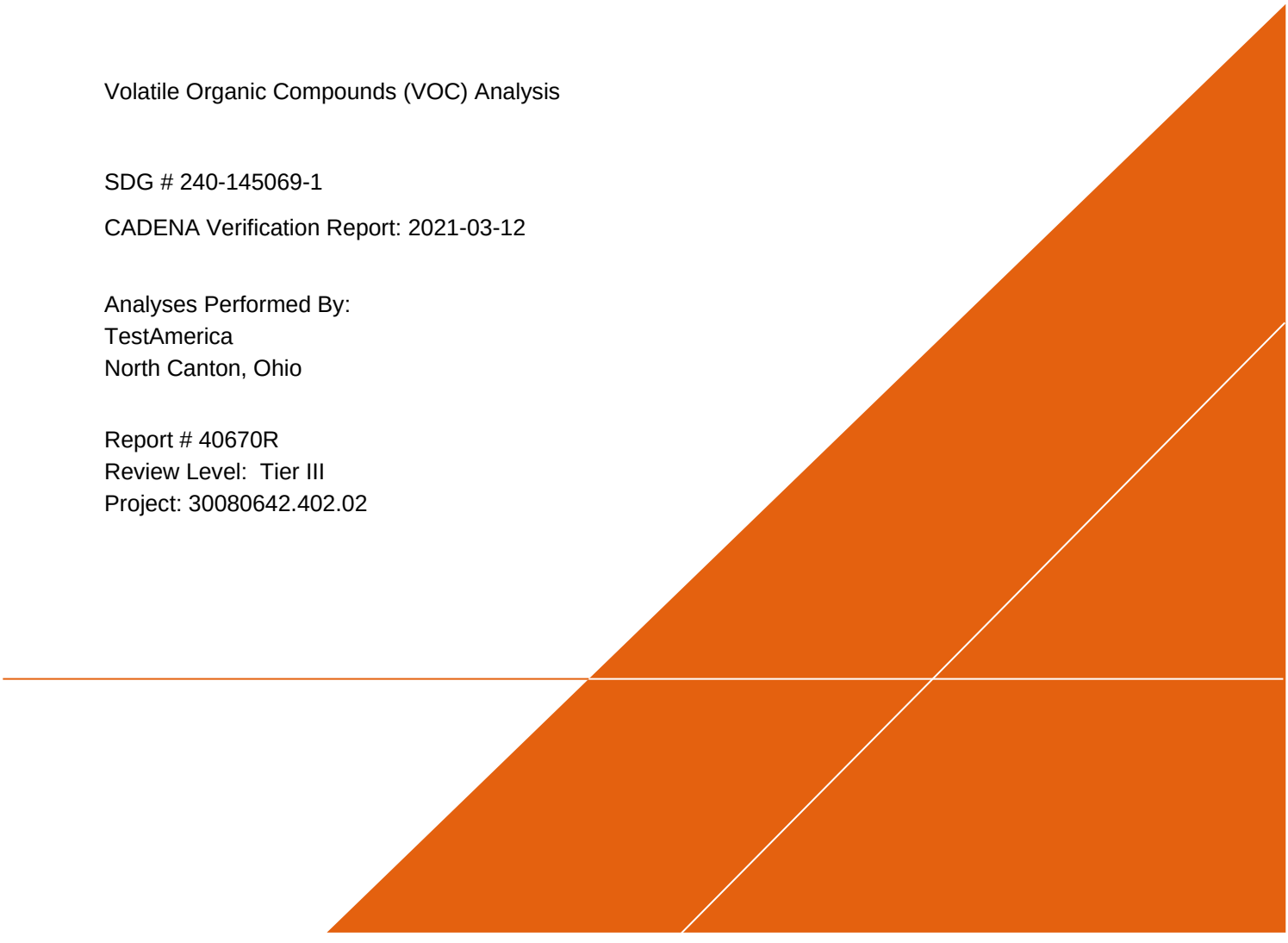
Volatile Organic Compounds (VOC) Analysis

SDG # 240-145069-1

CADENA Verification Report: 2021-03-12

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40670R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-145069-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-145069-1	Water	02/24/2021		X	
MW-152S_022421	240-145069-2	Water	02/24/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

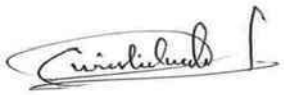
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 23, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 24, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

2/6/12

Chain of Custody Record

TestAmerica MICHIGAN 190

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: EMMA Witherspoon	TAT if different from below: 10 day; 3 weeks; 2 weeks (✓); 1 week; 2 days; 1 day		Walk-in client; Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30050315.402.04	Shipping/Tracking No:			
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 TRIP BLANK
MW-15S_022421	2/24/21	1600		G						G					N	G	X	X	X	X	X	X	X	3 vials for 8260B; 3 vials for 8260B SIM

240-145069 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; ✓ Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Emma Witherspoon	Arcadis	2/24/21 1700	Now cold storage	Arcadis	2/24/21 1700
Julia McClafferty	Arcadis	2/25/2021	Amanda Battenhill	ETA	2/25/21 10:03
Amanda Battenhill	ETA	2/25/21 1238	Received in Laboratory by: MJS ETA CANTON	Company: FEB 26 2021	Date/Time: 800

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03/12/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-145069-1

Date Collected: 02/24/21 00:00
Matrix: Water
Date Received: 02/26/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 23:42	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 23:42	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 23:42	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 23:42	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 23:42	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 23:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 130*		*03/02/21 23:42*	*1*
4-Bromofluorobenzene (Surr)	*97*		*47 - 134*		*03/02/21 23:42*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*03/02/21 23:42*	*1*
Dibromofluoromethane (Surr)	*85*		*78 - 129*		*03/02/21 23:42*	*1*

Client Sample ID: MW-152S_022421
Lab Sample ID: 240-145069-2

Date Collected: 02/24/21 16:00
Matrix: Water
Date Received: 02/26/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 18:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*70 - 133*		*03/01/21 18:54*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 00:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 00:07	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 00:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 00:07	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 00:07	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 00:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*		*03/03/21 00:07*	*1*
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*		*03/03/21 00:07*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*03/03/21 00:07*	*1*
Dibromofluoromethane (Surr)	*85*		*78 - 129*		*03/03/21 00:07*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-145073-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/12/2021 4:31:20 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
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Have a Question? Ask The Expert
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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145073-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145073-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145073-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-145073-1	TRIP BLANK	Water	02/24/21 00:00	02/26/21 17:49	
240-145073-2	MW-163S_022421	Water	02/24/21 12:05	02/26/21 17:49	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145073-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-145073-1

No Detections.

Client Sample ID: MW-163S_022421 — Lab Sample ID: 240-145073-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145073-1

Client Sample ID: TRIP BLANK

Date Collected: 02/24/21 00:00
Date Received: 02/26/21 17:49

Lab Sample ID: 240-145073-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 14:49	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 14:49	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 14:49	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 14:49	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 14:49	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 14:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*75 - 130*		*03/03/21 14:49*	*1*
4-Bromofluorobenzene (Surr)	*80*		*47 - 134*		*03/03/21 14:49*	*1*
Toluene-d8 (Surr)	*89*		*69 - 122*		*03/03/21 14:49*	*1*
Dibromofluoromethane (Surr)	*109*		*78 - 129*		*03/03/21 14:49*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145073-1

Client Sample ID: MW-163S_022421
Date Collected: 02/24/21 12:05
Date Received: 02/26/21 17:49

Lab Sample ID: 240-145073-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 19:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*70 - 133*		*03/01/21 19:44*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 15:11	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 15:11	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 15:11	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 15:11	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 15:11	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 15:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*75 - 130*		*03/03/21 15:11*	*1*
4-Bromofluorobenzene (Surr)	*79*		*47 - 134*		*03/03/21 15:11*	*1*
Toluene-d8 (Surr)	*87*		*69 - 122*		*03/03/21 15:11*	*1*
Dibromofluoromethane (Surr)	*113*		*78 - 129*		*03/03/21 15:11*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145073-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144838-B-2 MS	Matrix Spike	89	98	95	107
240-144838-B-2 MSD	Matrix Spike Duplicate	85	96	93	101
240-145073-1	TRIP BLANK	96	80	89	109
240-145073-2	MW-163S_022421	96	79	87	113
LCS 240-475239/4	Lab Control Sample	87	95	93	103
MB 240-475239/7	Method Blank	92	79	88	103

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144807-J-4 MS	Matrix Spike	90
240-144807-J-4 MSD	Matrix Spike Duplicate	88
240-145073-2	MW-163S_022421	97
LCS 240-474842/4	Lab Control Sample	90
MB 240-474842/5	Method Blank	86

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475239/7
Matrix: Water
Analysis Batch: 475239

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 11:11	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 11:11	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 11:11	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 11:11	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 11:11	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 11:11	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*		*03/03/21 11:11*	*1*
4-Bromofluorobenzene (Surr)	*79*		*47 - 134*		*03/03/21 11:11*	*1*
Toluene-d8 (Surr)	*88*		*69 - 122*		*03/03/21 11:11*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*03/03/21 11:11*	*1*

Lab Sample ID: LCS 240-475239/4
Matrix: Water
Analysis Batch: 475239

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	12.8		ug/L		128	73 - 129
cis-1,2-Dichloroethene	10.0	11.1		ug/L		111	75 - 124
Tetrachloroethene	10.0	10.5		ug/L		105	70 - 125
trans-1,2-Dichloroethene	10.0	11.0		ug/L		110	74 - 130
Trichloroethene	10.0	10.2		ug/L		102	71 - 121
Vinyl chloride	10.0	11.0		ug/L		110	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*103*		*78 - 129*

Lab Sample ID: 240-144838-B-2 MS
Matrix: Water
Analysis Batch: 475239

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*75 - 130*
4-Bromofluorobenzene (Surr)	*98*		*47 - 134*
Toluene-d8 (Surr)	*95*		*69 - 122*
Dibromofluoromethane (Surr)	*107*		*78 - 129*

Lab Sample ID: 240-144838-B-2 MSD
Matrix: Water
Analysis Batch: 475239

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*75 - 130*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144838-B-2 MSD
Matrix: Water
Analysis Batch: 475239

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*101*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474842/5
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 12:12	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*		*03/01/21 12:12*	*1*

Lab Sample ID: LCS 240-474842/4
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	9.05		ug/L		91	80 - 135		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*90*		*70 - 133*

Lab Sample ID: 240-144807-J-4 MS
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	8.95		ug/L		90	46 - 170		

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*90*		*70 - 133*

Lab Sample ID: 240-144807-J-4 MSD
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.28		ug/L		93	46 - 170	4	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145073-1

GC/MS VOA

Analysis Batch: 474842

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-145073-2	MW-163S_022421	Total/NA	Water	8260B SIM	
MB 240-474842/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474842/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144807-J-4 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144807-J-4 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 475239

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-145073-1	TRIP BLANK	Total/NA	Water	8260B	
240-145073-2	MW-163S_022421	Total/NA	Water	8260B	
MB 240-475239/7	Method Blank	Total/NA	Water	8260B	
LCS 240-475239/4	Lab Control Sample	Total/NA	Water	8260B	
240-144838-B-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144838-B-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145073-1

Client Sample ID: TRIP BLANK
Date Collected: 02/24/21 00:00
Date Received: 02/26/21 17:49

Lab Sample ID: 240-145073-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475239	03/03/21 14:49	LEE	TAL CAN

Client Sample ID: MW-163S_022421
Date Collected: 02/24/21 12:05
Date Received: 02/26/21 17:49

Lab Sample ID: 240-145073-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475239	03/03/21 15:11	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	474842	03/01/21 19:44	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145073-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

16167

Chain of Custody Record

MICHIGAN 190 TestAmerica

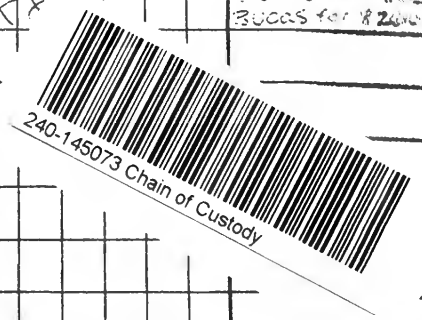
TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Emma Witherspoon	TAT if different from below		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:	10 day ✓ 3 weeks 2 weeks 1 week 2 days 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAcet NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-163S_022421	2/24/21	1205		6						6					N	G	X	X	X	X	X	X	X	3 vocs for 8260B 3 vocs for 8260B SIM



Possible Hazard Identification
✓ Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Return to Client ✓ Disposal By Lab Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cedena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Elizabeth Witherspoon	Arcadis	2/24/21 1700	Novi cold storage	Arcadis	2/24/21 1700
Julia McClafferty	Arcadis	2/25/2021	Amanda Battershell	ETA	2/25/21 1003
Amanda Battershell	ETA	2/25/21 1238	Received in Laboratory by:	Company:	Date/Time:

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 440-145673
Canton Facility

Client Arcadis Site Name

Cooler Received on FEB 26 2021 Opened on FEB 26 2021

Cooler unpacked by: MJS ETA CANTON

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # NA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.6 °C Corrected Cooler Temp. 1.7 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 — Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? — Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? — Yes No
   -Were tamper/custody seals intact and uncompromised? — Yes No NA
3. Shippers' packing slip attached to the cooler(s)? — Yes No
4. Did custody papers accompany the sample(s)? — Yes No
5. Were the custody papers relinquished & signed in the appropriate place? — Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? — Yes No
7. Did all bottles arrive in good condition (Unbroken)? — Yes No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? — Yes No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? — Yes No
11. Sufficient quantity received to perform indicated analyses? — Yes No
12. Are these work share samples and all listed on the COC? — Yes No
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? — Yes No NA pH Strip Lot# HC907861
14. Were VOAs on the COC? — Yes No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this. — Yes No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # NA — Yes No
17. Was a LL Hg or Me Hg trip blank present? — Yes No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by: MJS ETA CANTON

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

WI-NC-099

DATA VERIFICATION REPORT



March 12, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 145073-1
Sample date: 2021-02-24
Report received by CADENA: 2021-03-12
Initial Data Verification completed by CADENA: 2021-03-12
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

> The matrix spike/matrix spike duplicate (MS/MSD) analytes were not reported, because the analyte list for these samples did not match the analyte list for the MS/MSD parent sample.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 145073-1

		Sample Name:	TRIP BLANK				MW-163S_022421			
		Lab Sample ID:	2401450731				2401450732			
		Sample Date:	2/24/2021				2/24/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

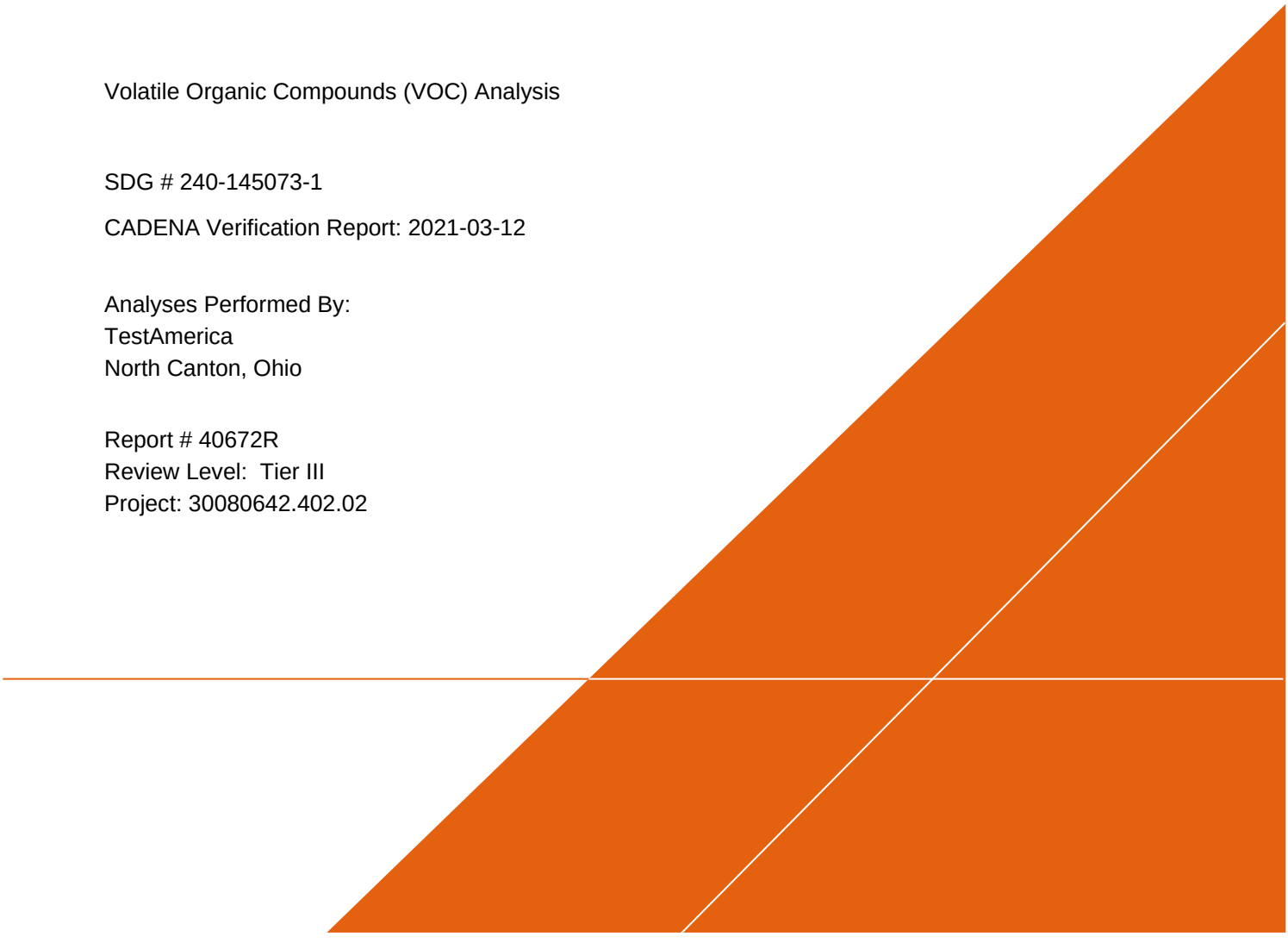
Volatile Organic Compounds (VOC) Analysis

SDG # 240-145073-1

CADENA Verification Report: 2021-03-12

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40672R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-145073-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-145073-1	Water	02/24/2021		X	
MW-163S_022421	240-145073-2	Water	02/24/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

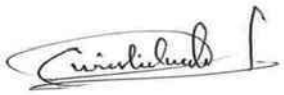
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 23, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 24, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

1/6/17

Chain of Custody Record

MICHIGAN 190 TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No:
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below	of COCs
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:	10 day (3 weeks, 2 weeks, 1 week, 2 days, 1 day)	For lab use only
Project Number: 30050315.402.04	Shipping/Tracking No:		Walk-in client
PO # 30050315.402.04			Lab sampling
			Job/SDG No:

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-163S_022421	2/24/21	1205		6						6					N	G	X	X	X	X	X	X	X	3 VOCs for 8260B 3 VOCs for 8260B SIM

240-145073 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company:	Date/Time:		Company:	Date/Time:
Relinquished by: Kristoffer Spoon	Arcadis	2/24/21	Received by: Novi cold storage	Arcadis	2/24/21 1700
Relinquished by: Julia McClafferty	Arcadis	2/25/2021	Received by: Amanda Battershell	ETA	2/25/21 1023
Relinquished by: Amanda Battershell	ETA	2/25/21 1238	Received in Laboratory by:	Company:	Date/Time:

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-145073-1
Date Collected: 02/24/21 00:00
Matrix: Water
Date Received: 02/26/21 17:49

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 14:49	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 14:49	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 14:49	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 14:49	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 14:49	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 14:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*75 - 130*		*03/03/21 14:49*	*1*
4-Bromofluorobenzene (Surr)	*80*		*47 - 134*		*03/03/21 14:49*	*1*
Toluene-d8 (Surr)	*89*		*69 - 122*		*03/03/21 14:49*	*1*
Dibromofluoromethane (Surr)	*109*		*78 - 129*		*03/03/21 14:49*	*1*

Client Sample ID: MW-163S_022421
Lab Sample ID: 240-145073-2
Date Collected: 02/24/21 12:05
Matrix: Water
Date Received: 02/26/21 17:49

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 19:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*70 - 133*		*03/01/21 19:44*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 15:11	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 15:11	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 15:11	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 15:11	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 15:11	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 15:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*75 - 130*		*03/03/21 15:11*	*1*
4-Bromofluorobenzene (Surr)	*79*		*47 - 134*		*03/03/21 15:11*	*1*
Toluene-d8 (Surr)	*87*		*69 - 122*		*03/03/21 15:11*	*1*
Dibromofluoromethane (Surr)	*113*		*78 - 129*		*03/03/21 15:11*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-145072-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/12/2021 4:30:17 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145072-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145072-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145072-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-145072-1	TRIP BLANK	Water	02/24/21 00:00	02/26/21 08:00	
240-145072-2	MW-130S_022421	Water	02/24/21 14:20	02/26/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145072-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-145072-1

No Detections.

Client Sample ID: MW-130S_022421 — Lab Sample ID: 240-145072-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	0.51	J	1.0	0.20	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145072-1

Client Sample ID: TRIP BLANK
Date Collected: 02/24/21 00:00
Date Received: 02/26/21 08:00

Lab Sample ID: 240-145072-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 14:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 14:06	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 14:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 14:06	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 14:06	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 14:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*75 - 130*		*03/03/21 14:06*	*1*
4-Bromofluorobenzene (Surr)	*78*		*47 - 134*		*03/03/21 14:06*	*1*
Toluene-d8 (Surr)	*87*		*69 - 122*		*03/03/21 14:06*	*1*
Dibromofluoromethane (Surr)	*107*		*78 - 129*		*03/03/21 14:06*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145072-1

Client Sample ID: MW-130S_022421
Date Collected: 02/24/21 14:20
Date Received: 02/26/21 08:00

Lab Sample ID: 240-145072-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 19:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*70 - 133*		*03/01/21 19:19*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 14:27	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 14:27	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 14:27	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 14:27	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 14:27	1
Vinyl chloride	**0.51**	**J**	1.0	0.20	ug/L			03/03/21 14:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*		*03/03/21 14:27*	*1*
4-Bromofluorobenzene (Surr)	*79*		*47 - 134*		*03/03/21 14:27*	*1*
Toluene-d8 (Surr)	*87*		*69 - 122*		*03/03/21 14:27*	*1*
Dibromofluoromethane (Surr)	*106*		*78 - 129*		*03/03/21 14:27*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145072-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144838-B-2 MS	Matrix Spike	89	98	95	107
240-144838-B-2 MSD	Matrix Spike Duplicate	85	96	93	101
240-145072-1	TRIP BLANK	94	78	87	107
240-145072-2	MW-130S_022421	97	79	87	106
LCS 240-475239/4	Lab Control Sample	87	95	93	103
MB 240-475239/7	Method Blank	92	79	88	103

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144807-J-4 MS	Matrix Spike	90
240-144807-J-4 MSD	Matrix Spike Duplicate	88
240-145072-2	MW-130S_022421	87
LCS 240-474842/4	Lab Control Sample	90
MB 240-474842/5	Method Blank	86

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475239/7
Matrix: Water
Analysis Batch: 475239

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 11:11	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 11:11	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 11:11	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 11:11	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 11:11	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 11:11	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*		*03/03/21 11:11*	*1*
4-Bromofluorobenzene (Surr)	*79*		*47 - 134*		*03/03/21 11:11*	*1*
Toluene-d8 (Surr)	*88*		*69 - 122*		*03/03/21 11:11*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*03/03/21 11:11*	*1*

Lab Sample ID: LCS 240-475239/4
Matrix: Water
Analysis Batch: 475239

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	12.8		ug/L		128	73 - 129
cis-1,2-Dichloroethene	10.0	11.1		ug/L		111	75 - 124
Tetrachloroethene	10.0	10.5		ug/L		105	70 - 125
trans-1,2-Dichloroethene	10.0	11.0		ug/L		110	74 - 130
Trichloroethene	10.0	10.2		ug/L		102	71 - 121
Vinyl chloride	10.0	11.0		ug/L		110	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*103*		*78 - 129*

Lab Sample ID: 240-144838-B-2 MS
Matrix: Water
Analysis Batch: 475239

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*75 - 130*
4-Bromofluorobenzene (Surr)	*98*		*47 - 134*
Toluene-d8 (Surr)	*95*		*69 - 122*
Dibromofluoromethane (Surr)	*107*		*78 - 129*

Lab Sample ID: 240-144838-B-2 MSD
Matrix: Water
Analysis Batch: 475239

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*75 - 130*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144838-B-2 MSD
Matrix: Water
Analysis Batch: 475239

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*101*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474842/5
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 12:12	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*		*03/01/21 12:12*	*1*

Lab Sample ID: LCS 240-474842/4
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	9.05		ug/L		91	80 - 135		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*90*		*70 - 133*

Lab Sample ID: 240-144807-J-4 MS
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	8.95		ug/L		90	46 - 170		

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*90*		*70 - 133*

Lab Sample ID: 240-144807-J-4 MSD
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.28		ug/L		93	46 - 170	4	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145072-1

GC/MS VOA

Analysis Batch: 474842

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-145072-2	MW-130S_022421	Total/NA	Water	8260B SIM	
MB 240-474842/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474842/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144807-J-4 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144807-J-4 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 475239

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-145072-1	TRIP BLANK	Total/NA	Water	8260B	
240-145072-2	MW-130S_022421	Total/NA	Water	8260B	
MB 240-475239/7	Method Blank	Total/NA	Water	8260B	
LCS 240-475239/4	Lab Control Sample	Total/NA	Water	8260B	
240-144838-B-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144838-B-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145072-1

Client Sample ID: TRIP BLANK
Date Collected: 02/24/21 00:00
Date Received: 02/26/21 08:00

Lab Sample ID: 240-145072-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475239	03/03/21 14:06	LEE	TAL CAN

Client Sample ID: MW-130S_022421
Date Collected: 02/24/21 14:20
Date Received: 02/26/21 08:00

Lab Sample ID: 240-145072-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475239	03/03/21 14:27	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	474842	03/01/21 19:19	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145072-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

16617

Chain of Custody Record

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica MICHIGAN 190

TestAmerica Laboratories, Inc.

Regulatory program: — DW — NPDES — RCRA — Other

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day ✓ 3 weeks — 2 weeks — 1 week — 2 days — 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 TRIP BLANK
MW-130S_022421	2/24/21	1420		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260BSIM

240-145072 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard — Flammable — Skin Irritant — Poison B — Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client ✓ Disposal By Lab — Archive For — Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Emma Witherspoon	Arcadis	2/24/21 1700	Novi Cold Storage	Arcadis	2/24/21 1700
Julia McClafferty	Arcadis	2/25/2021	Amanda Butterfield	ETA	2/25/21 1003
Amanda Butterfield	ETA	2/25/21 1238	Received in Laboratory by:	Company:	Date/Time:

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3/12/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 440-145072
Canton Facility

Client Arcadis Site Name

Cooler Received on FEB 26 2021 Opened on FEB 26 2021

Cooler unpacked by: MJS ETA CANTON

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # NA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.6 °C Corrected Cooler Temp. 1.7 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
   -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? Yes No
11. Sufficient quantity received to perform indicated analyses? Yes No
12. Are these work share samples and all listed on the COC? Yes No
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC907861
14. Were VOAs on the COC? Yes No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this. Yes No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # NA Yes No
17. Was a LL Hg or Me Hg trip blank present? Yes No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by: MJS ETA CANTON

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container.
Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.
Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

WI-NC-099

DATA VERIFICATION REPORT

March 12, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 145072-1
Sample date: 2021-02-24
Report received by CADENA: 2021-03-12
Initial Data Verification completed by CADENA: 2021-03-12
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

> The matrix spike/matrix spike duplicate (MS/MSD) analytes were not reported, because the analyte list for these samples did not match the analyte list for the MS/MSD parent sample.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 145072-1

		Sample Name:	TRIP BLANK				MW-130S_022421			
		Lab Sample ID:	2401450721				2401450722			
		Sample Date:	2/24/2021				2/24/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	0.51	1.0	ug/l	J
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

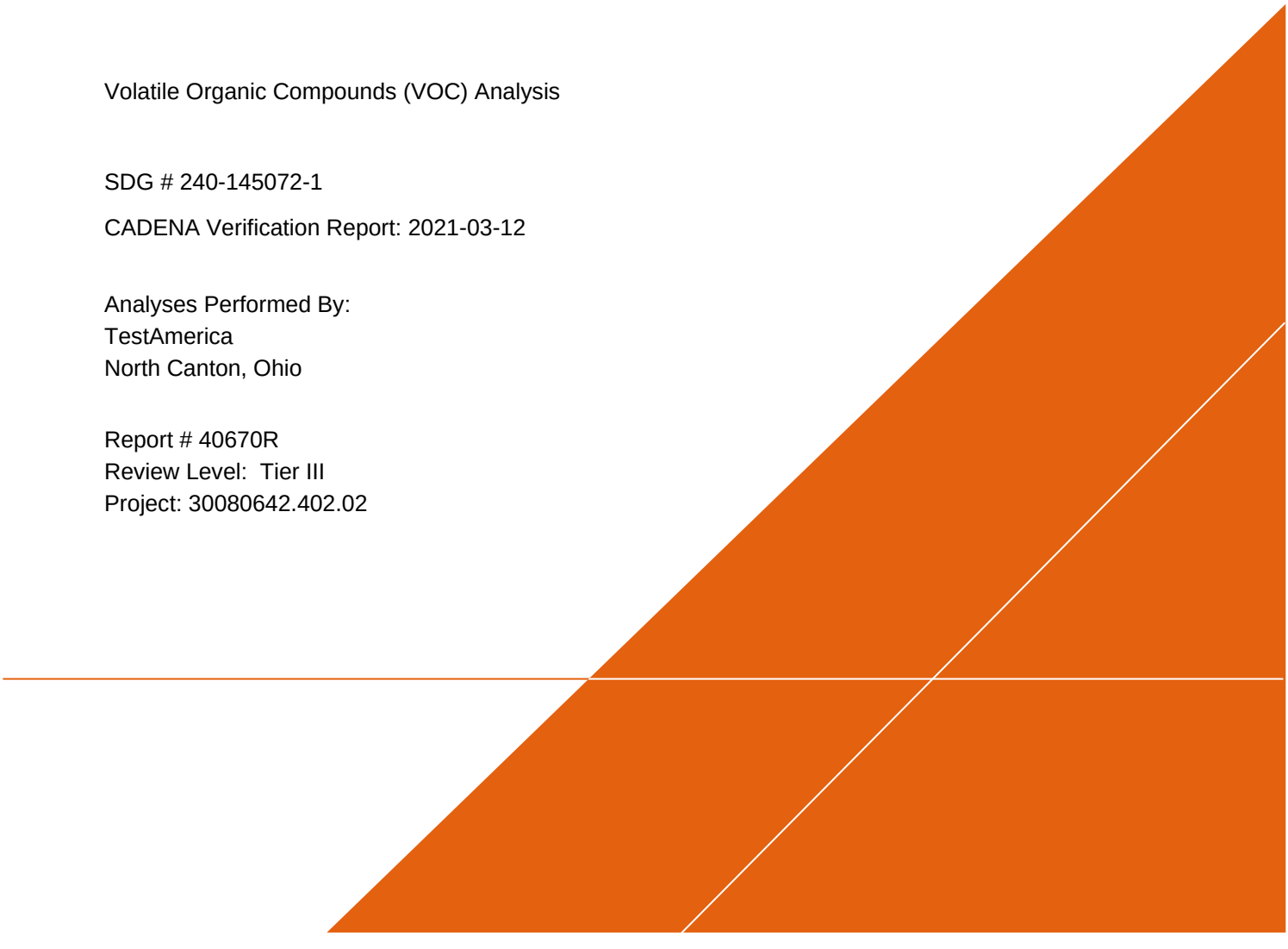
Volatile Organic Compounds (VOC) Analysis

SDG # 240-145072-1

CADENA Verification Report: 2021-03-12

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40670R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-145072-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-145072-1	Water	02/24/2021		X	
MW-130S_022421	240-145072-2	Water	02/24/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

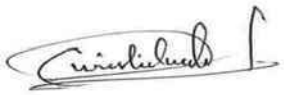
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 23, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 24, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

16617

Chain of Custody Record

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

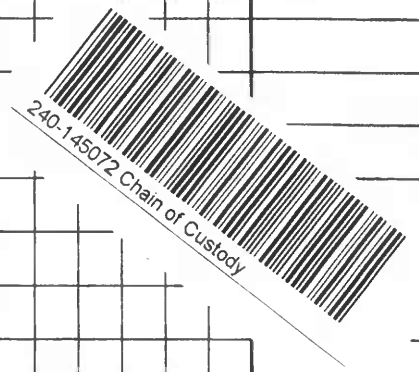
TestAmerica MICHIGAN 190

TestAmerica Laboratories, Inc.

Regulatory program: DW NPDES RCRA Other

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				of COCs
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; 3 weeks / 2 weeks / 1 week / 2 days / 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 TRIP BLANK
MW-130S_022421	2/24/21	1420		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM



Possible Hazard Identification: Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / Disposal By Lab / Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Emma Witherspoon	Arcadis	2/24/21 1700	Novi Cold Storage	Arcadis	2/24/21 1700
Julia McClafferty	Arcadis	2/25/2021	Amanda Butterfield	ETA	2/25/21 1003
Amanda Butterfield	ETA	2/25/21 1238	Received in Laboratory by:	Company:	Date/Time:

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-145072-1

Date Collected: 02/24/21 00:00
Matrix: Water
Date Received: 02/26/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 14:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 14:06	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 14:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 14:06	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 14:06	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 14:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*75 - 130*		*03/03/21 14:06*	*1*
4-Bromofluorobenzene (Surr)	*78*		*47 - 134*		*03/03/21 14:06*	*1*
Toluene-d8 (Surr)	*87*		*69 - 122*		*03/03/21 14:06*	*1*
Dibromofluoromethane (Surr)	*107*		*78 - 129*		*03/03/21 14:06*	*1*

Client Sample ID: MW-130S_022421
Lab Sample ID: 240-145072-2

Date Collected: 02/24/21 14:20
Matrix: Water
Date Received: 02/26/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 19:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*70 - 133*		*03/01/21 19:19*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 14:27	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 14:27	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 14:27	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 14:27	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 14:27	1
Vinyl chloride	**0.51**	**J**	1.0	0.20	ug/L			03/03/21 14:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*		*03/03/21 14:27*	*1*
4-Bromofluorobenzene (Surr)	*79*		*47 - 134*		*03/03/21 14:27*	*1*
Toluene-d8 (Surr)	*87*		*69 - 122*		*03/03/21 14:27*	*1*
Dibromofluoromethane (Surr)	*106*		*78 - 129*		*03/03/21 14:27*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144657-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/5/2021 2:17:04 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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Have a Question? Ask The Expert

Visit us at:
www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Certification Summary 15
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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144657-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144657-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144657-1

Comments
No additional comments.

Receipt
The samples were received on 2/19/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.5° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144657-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144657-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144657-1	TRIP BLANK	Water	02/17/21 00:00	02/19/21 08:00	
240-144657-2	MW-164S_021721	Water	02/17/21 12:27	02/19/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144657-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144657-1

No Detections.

Client Sample ID: MW-164S_021721 — Lab Sample ID: 240-144657-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144657-1

Client Sample ID: TRIP BLANK

Date Collected: 02/17/21 00:00
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144657-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 15:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 15:44	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 15:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 15:44	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 15:44	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 15:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*02/26/21 15:44*	*1*
4-Bromofluorobenzene (Surr)	*82*		*47 - 134*		*02/26/21 15:44*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*02/26/21 15:44*	*1*
Dibromofluoromethane (Surr)	*97*		*78 - 129*		*02/26/21 15:44*	*1*

Client Sample ID: MW-164S_021721

Date Collected: 02/17/21 12:27
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144657-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 15:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/25/21 15:14*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 16:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 16:06	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 16:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 16:06	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 16:06	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 16:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*02/26/21 16:06*	*1*
4-Bromofluorobenzene (Surr)	*82*		*47 - 134*		*02/26/21 16:06*	*1*
Toluene-d8 (Surr)	*94*		*69 - 122*		*02/26/21 16:06*	*1*
Dibromofluoromethane (Surr)	*100*		*78 - 129*		*02/26/21 16:06*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144657-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144638-B-2 MS	Matrix Spike	97	87	94	98
240-144638-B-2 MSD	Matrix Spike Duplicate	98	92	99	98
240-144657-1	TRIP BLANK	100	82	92	97
240-144657-2	MW-164S_021721	101	82	94	100
LCS 240-474629/4	Lab Control Sample	95	92	95	98
MB 240-474629/6	Method Blank	95	83	94	92

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144568-J-3 MS	Matrix Spike	79
240-144568-J-3 MSD	Matrix Spike Duplicate	83
240-144657-2	MW-164S_021721	80
LCS 240-474490/4	Lab Control Sample	79
MB 240-474490/5	Method Blank	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474629/6
Matrix: Water
Analysis Batch: 474629

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 11:41	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 11:41	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 11:41	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 11:41	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 11:41	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 11:41	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*75 - 130*		*02/26/21 11:41*	*1*
4-Bromofluorobenzene (Surr)	*83*		*47 - 134*		*02/26/21 11:41*	*1*
Toluene-d8 (Surr)	*94*		*69 - 122*		*02/26/21 11:41*	*1*
Dibromofluoromethane (Surr)	*92*		*78 - 129*		*02/26/21 11:41*	*1*

Lab Sample ID: LCS 240-474629/4
Matrix: Water
Analysis Batch: 474629

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.40		ug/L		84	73 - 129
cis-1,2-Dichloroethene	10.0	9.53		ug/L		95	75 - 124
Tetrachloroethene	10.0	9.23		ug/L		92	70 - 125
trans-1,2-Dichloroethene	10.0	9.32		ug/L		93	74 - 130
Trichloroethene	10.0	9.32		ug/L		93	71 - 121
Vinyl chloride	10.0	9.30		ug/L		93	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*95*		*75 - 130*
4-Bromofluorobenzene (Surr)	*92*		*47 - 134*
Toluene-d8 (Surr)	*95*		*69 - 122*
Dibromofluoromethane (Surr)	*98*		*78 - 129*

Lab Sample ID: 240-144638-B-2 MS
Matrix: Water
Analysis Batch: 474629

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*
Toluene-d8 (Surr)	*94*		*69 - 122*
Dibromofluoromethane (Surr)	*98*		*78 - 129*

Lab Sample ID: 240-144638-B-2 MSD
Matrix: Water
Analysis Batch: 474629

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 130*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144638-B-2 MSD
Matrix: Water
Analysis Batch: 474629

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*92*		*47 - 134*
Toluene-d8 (Surr)	*99*		*69 - 122*
Dibromofluoromethane (Surr)	*98*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474490/5
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 12:43	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/25/21 12:43*	*1*

Lab Sample ID: LCS 240-474490/4
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.7		ug/L		107	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*

Lab Sample ID: 240-144568-J-3 MS
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	10.2		ug/L		102	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*

Lab Sample ID: 240-144568-J-3 MSD
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.2		ug/L		102	46 - 170	0	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*

GC/MS VOA

Analysis Batch: 474490

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144657-2	MW-164S_021721	Total/NA	Water	8260B SIM	
MB 240-474490/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474490/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144568-J-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144568-J-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474629

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144657-1	TRIP BLANK	Total/NA	Water	8260B	
240-144657-2	MW-164S_021721	Total/NA	Water	8260B	
MB 240-474629/6	Method Blank	Total/NA	Water	8260B	
LCS 240-474629/4	Lab Control Sample	Total/NA	Water	8260B	
240-144638-B-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144638-B-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144657-1

Client Sample ID: TRIP BLANK
Date Collected: 02/17/21 00:00
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144657-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474629	02/26/21 15:44	LEE	TAL CAN

Client Sample ID: MW-164S_021721
Date Collected: 02/17/21 12:27
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144657-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474629	02/26/21 16:06	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	474490	02/25/21 15:14	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144657-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

MICHIGAN 190 TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI. 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Kara Donahue		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below: 10 day

☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day

Analyses

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite–C / Grab–G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM					Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X					1 Trip Blank
MW-164S_021721	2/17/21	1227		6						6					N	G	X	X	X	X	X	X	X					3 VOAs for 8260 B 3 VOAs for 8260 BSIM

240-144657 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Kara Donahue	Arcadis	2/17/21 1705	Novi Cold Storage	Arcadis	2/17/21 1705
Julia McClafferty	Arcadis	2/18/2021	Amanda Battenfield	ETA	2/18/21 10:18
Amanda Battenfield	ETA	2/18/21 11:38	Received in Laboratory by:	TA	2-19-21 800

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3/5/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 144657
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by:

Cooler Received on 2-19-21 Opened on 2-19-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.4 °C Corrected Cooler Temp. 1.5 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC987861
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page — Samples processed by:

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

March 05, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144657-1
Sample date: 2021-02-17
Report received by CADENA: 2021-03-05
Initial Data Verification completed by CADENA: 2021-03-05
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144657-1

		Sample Name:	TRIP BLANK				MW-164S_021721			
		Lab Sample ID:	2401446571				2401446572			
		Sample Date:	2/17/2021				2/17/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

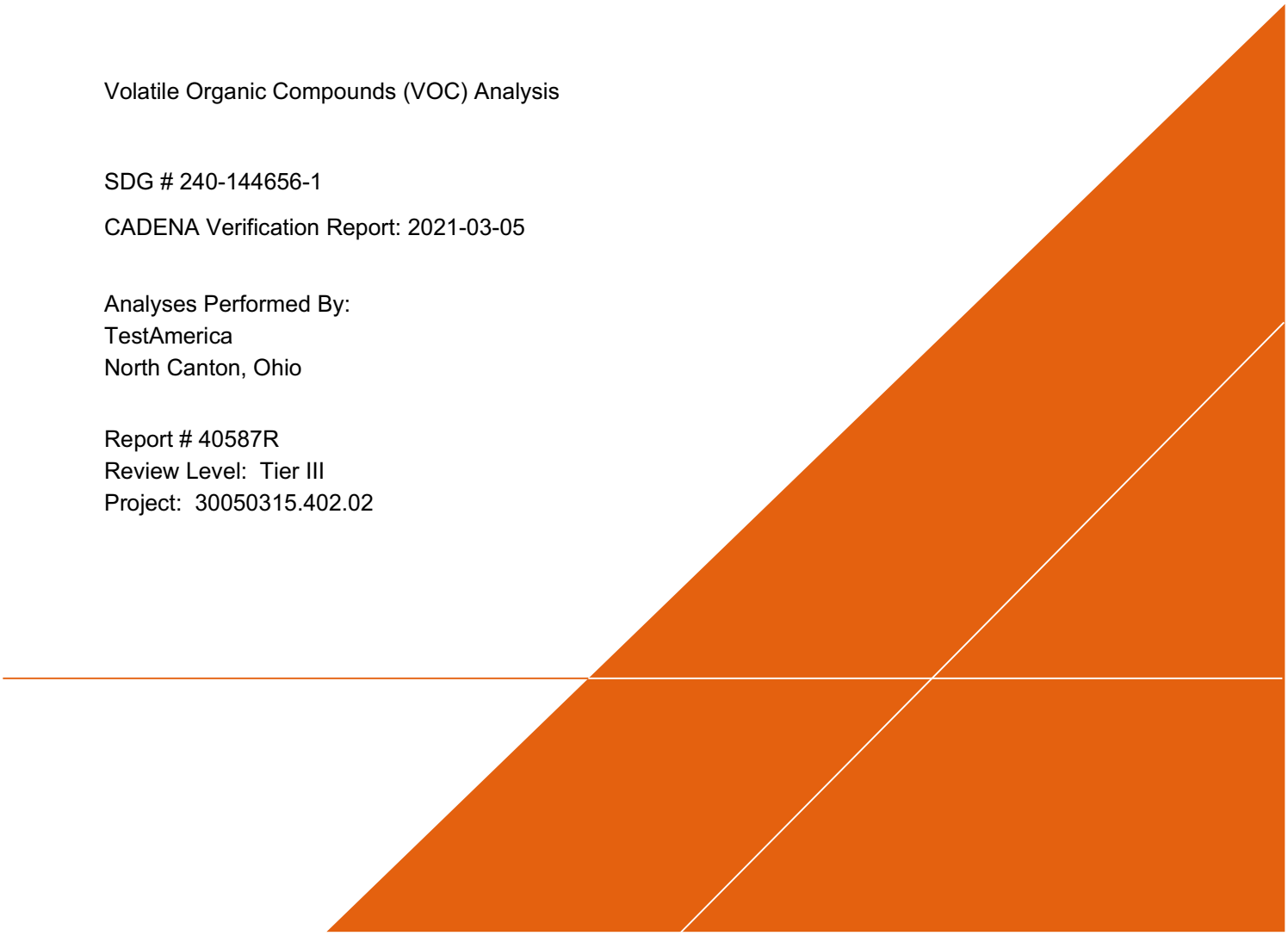
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144656-1

CADENA Verification Report: 2021-03-05

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40587R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144656-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144656-1	Water	02/17/2021		X	
MW-164S_021721	240-144656-2	Water	02/17/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 17, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 18, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN TestAmerica 190
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State Zip: Novi, MI, 48377	Sampler Name: Karen Donahue	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client:
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAcl NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite-C / Grab-G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1645_021721	2/17/21	1227		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260 B 3 VOAs for 8260 BSIM

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240-144657 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Karen Donahue	Arcadis	2/17/21 1705	Novi Cold Storage	Arcadis	2/17/21 1705
Julia McClafferty	Arcadis	2/18/2021	Amanda Butterfield	ETA	2/18/21 10:18
Amanda Butterfield	ETA	2/18/21 11:38	Received in Laboratory by:	Company: TA	Date/Time: 2-19-21 800

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03/05/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144657-1

Date Collected: 02/17/21 00:00
Matrix: Water
Date Received: 02/19/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 15:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 15:44	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 15:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 15:44	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 15:44	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 15:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*02/26/21 15:44*	*1*
4-Bromofluorobenzene (Surr)	*82*		*47 - 134*		*02/26/21 15:44*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*02/26/21 15:44*	*1*
Dibromofluoromethane (Surr)	*97*		*78 - 129*		*02/26/21 15:44*	*1*

Client Sample ID: MW-164S_021721
Lab Sample ID: 240-144657-2

Date Collected: 02/17/21 12:27
Matrix: Water
Date Received: 02/19/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 15:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/25/21 15:14*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 16:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 16:06	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 16:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 16:06	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 16:06	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 16:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*02/26/21 16:06*	*1*
4-Bromofluorobenzene (Surr)	*82*		*47 - 134*		*02/26/21 16:06*	*1*
Toluene-d8 (Surr)	*94*		*69 - 122*		*02/26/21 16:06*	*1*
Dibromofluoromethane (Surr)	*100*		*78 - 129*		*02/26/21 16:06*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144663-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/5/2021 2:20:20 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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Have a Question? Ask The Expert

Visit us at:
www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144663-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144663-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144663-1

Comments
No additional comments.

Receipt
The samples were received on 2/19/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.5° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144663-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144663-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144663-1	TRIP BLANK	Water	02/17/21 00:00	02/19/21 08:00	
240-144663-2	MW-153S_021721	Water	02/17/21 15:42	02/19/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144663-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144663-1

No Detections.

Client Sample ID: MW-153S_021721 — Lab Sample ID: 240-144663-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144663-1

Client Sample ID: TRIP BLANK

Date Collected: 02/17/21 00:00
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144663-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 18:10	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 18:10	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 18:10	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 18:10	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 18:10	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 18:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*75 - 130*		*02/25/21 18:10*	*1*
4-Bromofluorobenzene (Surr)	*67*		*47 - 134*		*02/25/21 18:10*	*1*
Toluene-d8 (Surr)	*82*		*69 - 122*		*02/25/21 18:10*	*1*
Dibromofluoromethane (Surr)	*110*		*78 - 129*		*02/25/21 18:10*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144663-1

Client Sample ID: MW-153S_021721
Date Collected: 02/17/21 15:42
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144663-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 16:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/25/21 16:55*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 20:33	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 20:33	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 20:33	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 20:33	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 20:33	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 20:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*111*		*75 - 130*		*02/25/21 20:33*	*1*
4-Bromofluorobenzene (Surr)	*66*		*47 - 134*		*02/25/21 20:33*	*1*
Toluene-d8 (Surr)	*81*		*69 - 122*		*02/25/21 20:33*	*1*
Dibromofluoromethane (Surr)	*109*		*78 - 129*		*02/25/21 20:33*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144663-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144663-1	TRIP BLANK	110	67	82	110
240-144663-2	MW-153S_021721	111	66	81	109
240-144711-E-2 MS	Matrix Spike	93	88	91	94
240-144711-F-2 MSD	Matrix Spike Duplicate	91	92	91	92
LCS 240-474507/4	Lab Control Sample	88	88	88	91
MB 240-474507/7	Method Blank	102	68	80	101

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144568-J-3 MS	Matrix Spike	79
240-144568-J-3 MSD	Matrix Spike Duplicate	83
240-144663-2	MW-153S_021721	80
LCS 240-474490/4	Lab Control Sample	79
MB 240-474490/5	Method Blank	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474507/7
Matrix: Water
Analysis Batch: 474507

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 17:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 17:22	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 17:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 17:22	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 17:22	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 17:22	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*75 - 130*		*02/25/21 17:22*	*1*
4-Bromofluorobenzene (Surr)	*68*		*47 - 134*		*02/25/21 17:22*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*02/25/21 17:22*	*1*
Dibromofluoromethane (Surr)	*101*		*78 - 129*		*02/25/21 17:22*	*1*

Lab Sample ID: LCS 240-474507/4
Matrix: Water
Analysis Batch: 474507

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.27		ug/L		93	73 - 129
cis-1,2-Dichloroethene	10.0	9.22		ug/L		92	75 - 124
Tetrachloroethene	10.0	11.5		ug/L		115	70 - 125
trans-1,2-Dichloroethene	10.0	9.77		ug/L		98	74 - 130
Trichloroethene	10.0	9.71		ug/L		97	71 - 121
Vinyl chloride	10.0	8.03		ug/L		80	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 130*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*
Toluene-d8 (Surr)	*88*		*69 - 122*
Dibromofluoromethane (Surr)	*91*		*78 - 129*

Lab Sample ID: 240-144711-E-2 MS
Matrix: Water
Analysis Batch: 474507

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	8.83		ug/L		88	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	8.92		ug/L		89	68 - 121
Tetrachloroethene	1.0	U	10.0	11.2		ug/L		112	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.58		ug/L		96	69 - 126
Trichloroethene	1.0	U	10.0	9.00		ug/L		90	56 - 124
Vinyl chloride	1.0	U	10.0	8.39		ug/L		84	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*
Toluene-d8 (Surr)	*91*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144711-E-2 MS
Matrix: Water
Analysis Batch: 474507

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	*94*		*78 - 129*

Lab Sample ID: 240-144711-F-2 MSD
Matrix: Water
Analysis Batch: 474507

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.03		ug/L		90	64 - 132	2	35
cis-1,2-Dichloroethene	1.0	U	10.0	9.44		ug/L		94	68 - 121	6	35
Tetrachloroethene	1.0	U	10.0	11.3		ug/L		113	52 - 129	1	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.55		ug/L		96	69 - 126	0	35
Trichloroethene	1.0	U	10.0	9.26		ug/L		93	56 - 124	3	35
Vinyl chloride	1.0	U	10.0	8.55		ug/L		86	49 - 136	2	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*91*		*75 - 130*
4-Bromofluorobenzene (Surr)	*92*		*47 - 134*
Toluene-d8 (Surr)	*91*		*69 - 122*
Dibromofluoromethane (Surr)	*92*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474490/5
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 12:43	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/25/21 12:43*	*1*

Lab Sample ID: LCS 240-474490/4
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.7		ug/L		107	80 - 135

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*

Lab Sample ID: 240-144568-J-3 MS
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	10.2		ug/L		102	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*

Lab Sample ID: 240-144568-J-3 MSD
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.2		ug/L		102	46 - 170	0	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*

GC/MS VOA

Analysis Batch: 474490

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144663-2	MW-153S_021721	Total/NA	Water	8260B SIM	
MB 240-474490/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474490/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144568-J-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144568-J-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474507

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144663-1	TRIP BLANK	Total/NA	Water	8260B	
240-144663-2	MW-153S_021721	Total/NA	Water	8260B	
MB 240-474507/7	Method Blank	Total/NA	Water	8260B	
LCS 240-474507/4	Lab Control Sample	Total/NA	Water	8260B	
240-144711-E-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144711-F-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144663-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144663-1

Date Collected: 02/17/21 00:00

Matrix: Water

Date Received: 02/19/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474507	02/25/21 18:10	LRW	TAL CAN

Client Sample ID: MW-153S_021721

Lab Sample ID: 240-144663-2

Date Collected: 02/17/21 15:42

Matrix: Water

Date Received: 02/19/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474507	02/25/21 20:33	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474490	02/25/21 16:55	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144663-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

TestAmerica MICHIGAN 190 — THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI. 48377	Sampler Name: Kara Donahue	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client: Lab sampling:
Phone: 248-994-2240	Method of Shipment/Carrier:			Job/SDG No:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1533_021721	2/17/21	1542		6						6					N	G	X	X	X	X	X	X	X	3VOAs for 8260B 3VOAs for 8260B SIM

240-144663 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Kara Donahue	Arcadis	2/17/21 1705	Novi Cold Storage	Arcadis	2/17/21 1705
Julia McClafferty	Arcadis	2/18/2021	Amanda Battistelli	ETA	2/18/21 10:18
Amanda Battistelli	ETA	2/18/21 1138	Received in Laboratory by:	Company: TA	Date/Time: 2-19-21 800

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3/5/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 144603
Canton Facility

Client Arcadis Site Name

Cooler unpacked by:

Cooler Received on 2-19-21 Opened on 2-19-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.4 °C Corrected Cooler Temp. 1.5 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # (Yes) No
17. Was a LL Hg or Me Hg trip blank present? Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container.
Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.
Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

DATA VERIFICATION REPORT

March 05, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144663-1
Sample date: 2021-02-17
Report received by CADENA: 2021-03-05
Initial Data Verification completed by CADENA: 2021-03-05
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144663-1

		Sample Name:	TRIP BLANK				MW-153S_021721			
		Lab Sample ID:	2401446631				2401446632			
		Sample Date:	2/17/2021				2/17/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

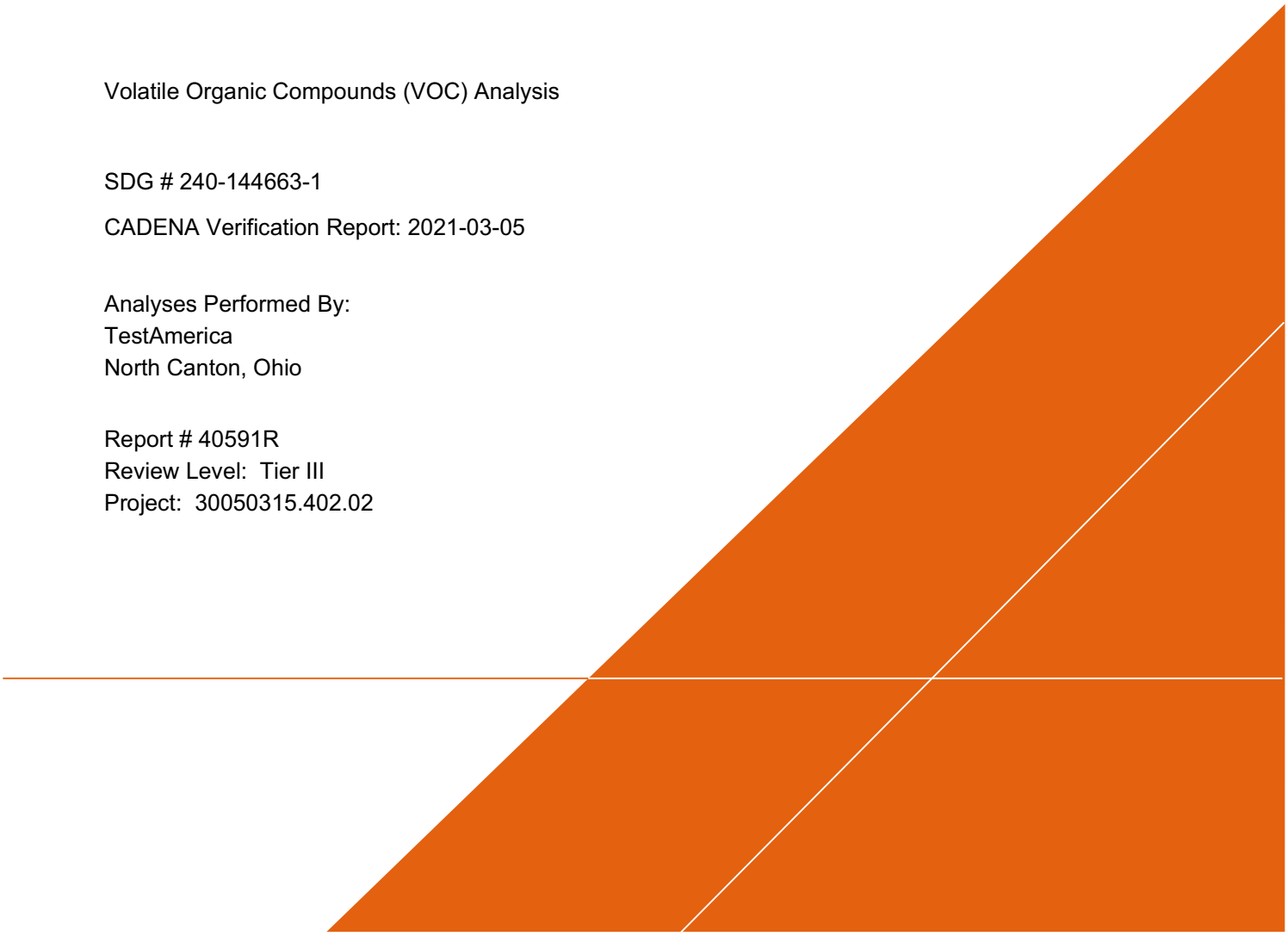
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144663-1

CADENA Verification Report: 2021-03-05

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40591R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144663-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144663-1	Water	02/17/2021		X	
MW-153S_021721	240-144663-2	Water	02/17/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 17, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 18, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica MICHIGAN 190 — THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				of COCs
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	
City/State/Zip: Novi, MI. 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Kara Donahue	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client: Lab sampling: Job/SDG No:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			
Project Number: 30050315.402.04	Shipping/Tracking No:			
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-1535_021721	2/17/21	1542		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260 B 3 VOAs for 8260 B SIM

240-144663 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Kara Donahue	Arcadis	2/17/21 1705	Novi Cold Storage	Arcadis	2/17/21 1705
Julia McClafferty	Arcadis	2/18/2021	Amanda Battistelli	ETA	2/18/21 10:18
Amanda Battistelli	ETA	2/18/21 1138	Received in Laboratory by:	Company: TA	Date/Time: 2-19-21 800

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03/05/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144663-1
Date Collected: 02/17/21 00:00
Matrix: Water
Date Received: 02/19/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 18:10	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 18:10	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 18:10	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 18:10	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 18:10	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 18:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*75 - 130*		*02/25/21 18:10*	*1*
4-Bromofluorobenzene (Surr)	*67*		*47 - 134*		*02/25/21 18:10*	*1*
Toluene-d8 (Surr)	*82*		*69 - 122*		*02/25/21 18:10*	*1*
Dibromofluoromethane (Surr)	*110*		*78 - 129*		*02/25/21 18:10*	*1*

Client Sample ID: MW-153S_021721
Lab Sample ID: 240-144663-2
Date Collected: 02/17/21 15:42
Matrix: Water
Date Received: 02/19/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 16:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/25/21 16:55*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 20:33	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 20:33	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 20:33	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 20:33	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 20:33	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 20:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*111*		*75 - 130*		*02/25/21 20:33*	*1*
4-Bromofluorobenzene (Surr)	*66*		*47 - 134*		*02/25/21 20:33*	*1*
Toluene-d8 (Surr)	*81*		*69 - 122*		*02/25/21 20:33*	*1*
Dibromofluoromethane (Surr)	*109*		*78 - 129*		*02/25/21 20:33*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144662-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/5/2021 2:19:45 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
Review your project results through TotalAccess
Have a Question? Ask The Expert
Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144662-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144662-1

Job ID: 240-144662-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144662-1

Comments
No additional comments.

Receipt
The samples were received on 2/19/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.5º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144662-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144662-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144662-1	TRIP BLANK	Water	02/17/21 00:00	02/19/21 08:00	
240-144662-2	MW-165S_021721	Water	02/17/21 11:02	02/19/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144662-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144662-1

No Detections.

Client Sample ID: MW-165S_021721 — Lab Sample ID: 240-144662-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144662-1

Client Sample ID: TRIP BLANK
Date Collected: 02/17/21 00:00
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144662-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 17:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 17:46	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 17:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 17:46	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 17:46	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 17:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*75 - 130*		*02/25/21 17:46*	*1*
4-Bromofluorobenzene (Surr)	*64*		*47 - 134*		*02/25/21 17:46*	*1*
Toluene-d8 (Surr)	*79*		*69 - 122*		*02/25/21 17:46*	*1*
Dibromofluoromethane (Surr)	*108*		*78 - 129*		*02/25/21 17:46*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144662-1

Client Sample ID: MW-165S_021721
Date Collected: 02/17/21 11:02
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144662-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 16:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/25/21 16:30*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 20:09	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 20:09	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 20:09	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 20:09	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 20:09	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 20:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*113*		*75 - 130*		*02/25/21 20:09*	*1*
4-Bromofluorobenzene (Surr)	*64*		*47 - 134*		*02/25/21 20:09*	*1*
Toluene-d8 (Surr)	*76*		*69 - 122*		*02/25/21 20:09*	*1*
Dibromofluoromethane (Surr)	*115*		*78 - 129*		*02/25/21 20:09*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144662-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144662-1	TRIP BLANK	106	64	79	108
240-144662-2	MW-165S_021721	113	64	76	115
240-144711-E-2 MS	Matrix Spike	93	88	91	94
240-144711-F-2 MSD	Matrix Spike Duplicate	91	92	91	92
LCS 240-474507/4	Lab Control Sample	88	88	88	91
MB 240-474507/7	Method Blank	102	68	80	101

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144568-J-3 MS	Matrix Spike	79
240-144568-J-3 MSD	Matrix Spike Duplicate	83
240-144662-2	MW-165S_021721	82
LCS 240-474490/4	Lab Control Sample	79
MB 240-474490/5	Method Blank	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474507/7
Matrix: Water
Analysis Batch: 474507

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 17:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 17:22	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 17:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 17:22	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 17:22	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 17:22	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*75 - 130*		*02/25/21 17:22*	*1*
4-Bromofluorobenzene (Surr)	*68*		*47 - 134*		*02/25/21 17:22*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*02/25/21 17:22*	*1*
Dibromofluoromethane (Surr)	*101*		*78 - 129*		*02/25/21 17:22*	*1*

Lab Sample ID: LCS 240-474507/4
Matrix: Water
Analysis Batch: 474507

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.27		ug/L		93	73 - 129
cis-1,2-Dichloroethene	10.0	9.22		ug/L		92	75 - 124
Tetrachloroethene	10.0	11.5		ug/L		115	70 - 125
trans-1,2-Dichloroethene	10.0	9.77		ug/L		98	74 - 130
Trichloroethene	10.0	9.71		ug/L		97	71 - 121
Vinyl chloride	10.0	8.03		ug/L		80	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 130*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*
Toluene-d8 (Surr)	*88*		*69 - 122*
Dibromofluoromethane (Surr)	*91*		*78 - 129*

Lab Sample ID: 240-144711-E-2 MS
Matrix: Water
Analysis Batch: 474507

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	8.83		ug/L		88	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	8.92		ug/L		89	68 - 121
Tetrachloroethene	1.0	U	10.0	11.2		ug/L		112	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.58		ug/L		96	69 - 126
Trichloroethene	1.0	U	10.0	9.00		ug/L		90	56 - 124
Vinyl chloride	1.0	U	10.0	8.39		ug/L		84	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*
Toluene-d8 (Surr)	*91*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144711-E-2 MS
Matrix: Water
Analysis Batch: 474507

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*94*		*78 - 129*

Lab Sample ID: 240-144711-F-2 MSD
Matrix: Water
Analysis Batch: 474507

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.03		ug/L		90	64 - 132	2	35
cis-1,2-Dichloroethene	1.0	U	10.0	9.44		ug/L		94	68 - 121	6	35
Tetrachloroethene	1.0	U	10.0	11.3		ug/L		113	52 - 129	1	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.55		ug/L		96	69 - 126	0	35
Trichloroethene	1.0	U	10.0	9.26		ug/L		93	56 - 124	3	35
Vinyl chloride	1.0	U	10.0	8.55		ug/L		86	49 - 136	2	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*91*		*75 - 130*
4-Bromofluorobenzene (Surr)	*92*		*47 - 134*
Toluene-d8 (Surr)	*91*		*69 - 122*
Dibromofluoromethane (Surr)	*92*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474490/5
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 12:43	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/25/21 12:43*	*1*

Lab Sample ID: LCS 240-474490/4
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.7		ug/L		107	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*

Lab Sample ID: 240-144568-J-3 MS
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	10.2		ug/L		102	46 - 170		

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*

Lab Sample ID: 240-144568-J-3 MSD
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.2		ug/L		102	46 - 170	0	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144662-1

GC/MS VOA

Analysis Batch: 474490

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144662-2	MW-165S_021721	Total/NA	Water	8260B SIM	
MB 240-474490/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474490/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144568-J-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144568-J-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474507

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144662-1	TRIP BLANK	Total/NA	Water	8260B	
240-144662-2	MW-165S_021721	Total/NA	Water	8260B	
MB 240-474507/7	Method Blank	Total/NA	Water	8260B	
LCS 240-474507/4	Lab Control Sample	Total/NA	Water	8260B	
240-144711-E-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144711-F-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144662-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144662-1

Date Collected: 02/17/21 00:00

Matrix: Water

Date Received: 02/19/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474507	02/25/21 17:46	LRW	TAL CAN

Client Sample ID: MW-165S_021721

Lab Sample ID: 240-144662-2

Date Collected: 02/17/21 11:02

Matrix: Water

Date Received: 02/19/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474507	02/25/21 20:09	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474490	02/25/21 16:30	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144662-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190

TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name:	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day (10 day)		Walk-in client:
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM					Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X					1 Trip Blank
MW-165S_021721	2/17/21	1102		6						6					N	G	X	X	X	X	X	X	X					3 VOAs for 8260B 3 VOAs for 8260B SIM

240-144662 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by:	Arcadis	2/17/21 1705	Received by: Novi Cold Storage	Arcadis	2/17/21 1705
Relinquished by:	Arcadis	2/18/2021	Received by:	ETA	2/18/21 10:18
Relinquished by:	ETA	2/18/21 1138	Received in Laboratory by:	TA	2-19-21 800

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3/5/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 144662
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by:

Cooler Received on 2-19-21 Opened on 2-19-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.4 °C Corrected Cooler Temp. 1.5 °C

IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page | Samples processed by:

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

WI-NC-099

DATA VERIFICATION REPORT

March 05, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144662-1
Sample date: 2021-02-17
Report received by CADENA: 2021-03-05
Initial Data Verification completed by CADENA: 2021-03-05
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144662-1

		Sample Name:	TRIP BLANK				MW-165S_021721			
		Lab Sample ID:	2401446621				2401446622			
		Sample Date:	2/17/2021				2/17/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

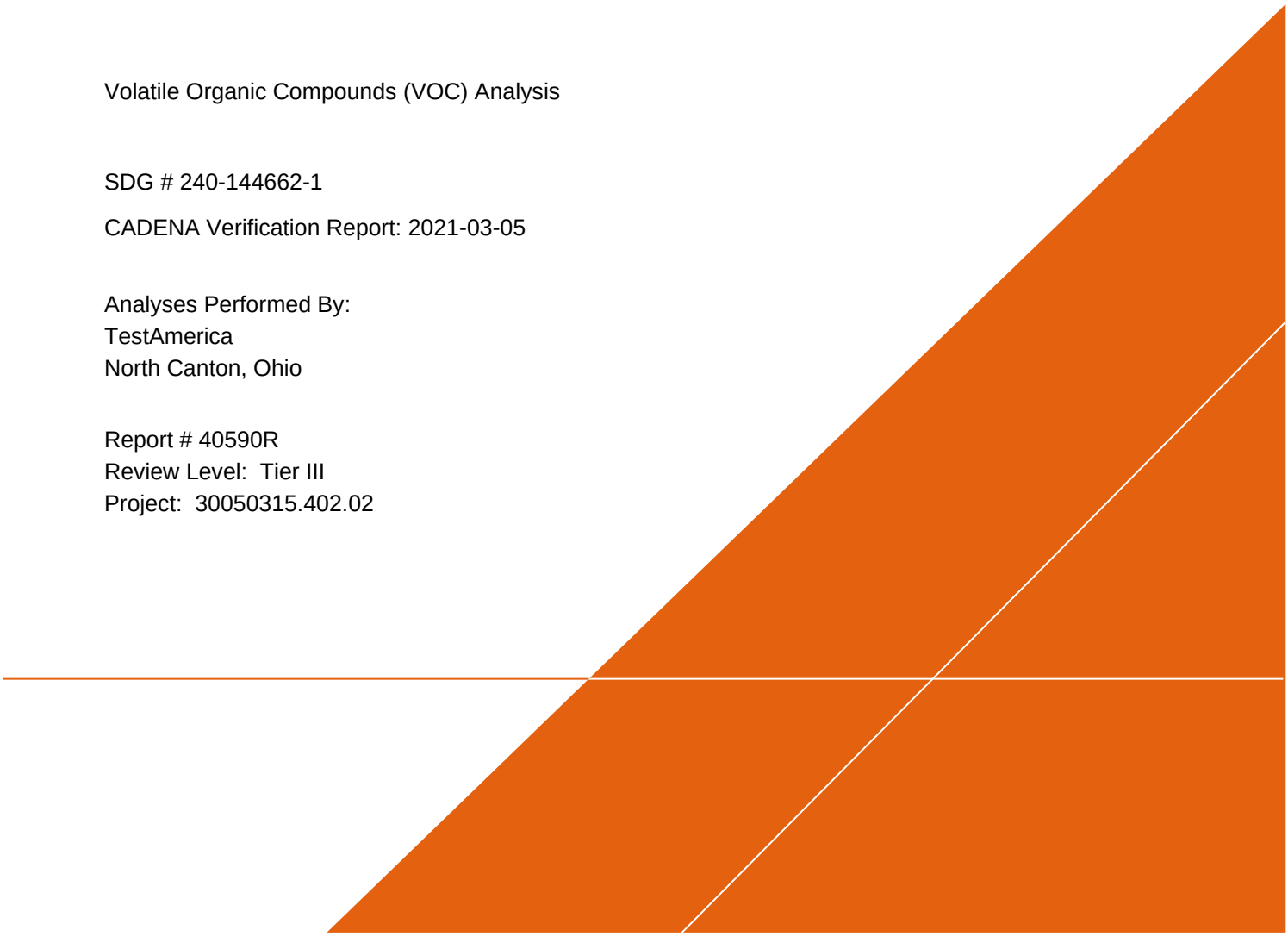
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144662-1

CADENA Verification Report: 2021-03-05

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40590R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144662-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144662-1	Water	02/17/2021		X	
MW-165S_021721	240-144662-2	Water	02/17/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

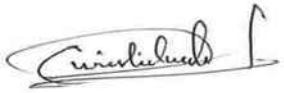
%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 17, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 18, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Karen Donahue		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below

10 day

☐ 3 weeks
☑ 2 weeks
☐ 1 week
☐ 2 days
☐ 1 day

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM					Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X					1 Trip Blank
MW-165S_021721	2/17/21	1102		6						6					N	G	X	X	X	X	X	X	X					3VOAs for 8260B 3VOAs for 8260B SIM

240-144662 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Karen Donahue	Arcadis	2/17/21 1705	Novi Cold Storage	Arcadis	2/17/21 1705
Julia McClafferty	Arcadis	2/18/2021	Amanda Battenfield	ETA	2/18/21 10:18
Amanda Battenfield	ETA	2/18/21 11:38	Received in Laboratory by:	Company: TA	Date/Time: 2-19-21 800

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144662-1
Date Collected: 02/17/21 00:00
Matrix: Water
Date Received: 02/19/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 17:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 17:46	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 17:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 17:46	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 17:46	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 17:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*75 - 130*		*02/25/21 17:46*	*1*
4-Bromofluorobenzene (Surr)	*64*		*47 - 134*		*02/25/21 17:46*	*1*
Toluene-d8 (Surr)	*79*		*69 - 122*		*02/25/21 17:46*	*1*
Dibromofluoromethane (Surr)	*108*		*78 - 129*		*02/25/21 17:46*	*1*

Client Sample ID: MW-165S_021721
Lab Sample ID: 240-144662-2
Date Collected: 02/17/21 11:02
Matrix: Water
Date Received: 02/19/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 16:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/25/21 16:30*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 20:09	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 20:09	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 20:09	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 20:09	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 20:09	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 20:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*113*		*75 - 130*		*02/25/21 20:09*	*1*
4-Bromofluorobenzene (Surr)	*64*		*47 - 134*		*02/25/21 20:09*	*1*
Toluene-d8 (Surr)	*76*		*69 - 122*		*02/25/21 20:09*	*1*
Dibromofluoromethane (Surr)	*115*		*78 - 129*		*02/25/21 20:09*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144658-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/5/2021 2:18:17 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at:
www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144658-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144658-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144658-1

Comments
No additional comments.

Receipt
The samples were received on 2/19/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.5° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144658-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144658-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144658-1	TRIP BLANK	Water	02/17/21 00:00	02/19/21 08:00	
240-144658-2	MW-154S_021721	Water	02/17/21 13:42	02/19/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144658-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144658-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Trichloroethene	0.20	J	1.0	0.10	ug/L	1		8260B	Total/NA

Client Sample ID: MW-154S_021721 — Lab Sample ID: 240-144658-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144658-1

Client Sample ID: TRIP BLANK

Date Collected: 02/17/21 00:00
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144658-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 20:16	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 20:16	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 20:16	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 20:16	1
Trichloroethene	**0.20**	**J**	1.0	0.10	ug/L			02/25/21 20:16	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 20:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*75 - 130*		*02/25/21 20:16*	*1*
4-Bromofluorobenzene (Surr)	*100*		*47 - 134*		*02/25/21 20:16*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*02/25/21 20:16*	*1*
Dibromofluoromethane (Surr)	*85*		*78 - 129*		*02/25/21 20:16*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144658-1

Client Sample ID: MW-154S_021721
Date Collected: 02/17/21 13:42
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144658-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 15:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*		*02/25/21 15:39*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 21:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 21:07	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 21:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 21:07	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 21:07	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 21:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*75 - 130*		*02/25/21 21:07*	*1*
4-Bromofluorobenzene (Surr)	*100*		*47 - 134*		*02/25/21 21:07*	*1*
Toluene-d8 (Surr)	*96*		*69 - 122*		*02/25/21 21:07*	*1*
Dibromofluoromethane (Surr)	*85*		*78 - 129*		*02/25/21 21:07*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144658-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144658-1	TRIP BLANK	83	100	92	85
240-144658-2	MW-154S_021721	85	100	96	85
240-144661-D-2 MS	Matrix Spike	84	99	93	86
240-144661-E-2 MSD	Matrix Spike Duplicate	84	99	94	87
LCS 240-474500/4	Lab Control Sample	85	101	93	86
MB 240-474500/7	Method Blank	86	98	94	86

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144568-J-3 MS	Matrix Spike	79
240-144568-J-3 MSD	Matrix Spike Duplicate	83
240-144658-2	MW-154S_021721	79
LCS 240-474490/4	Lab Control Sample	79
MB 240-474490/5	Method Blank	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474500/7
Matrix: Water
Analysis Batch: 474500

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 14:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 14:52	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 14:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 14:52	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 14:52	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 14:52	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*		*02/25/21 14:52*	*1*
4-Bromofluorobenzene (Surr)	*98*		*47 - 134*		*02/25/21 14:52*	*1*
Toluene-d8 (Surr)	*94*		*69 - 122*		*02/25/21 14:52*	*1*
Dibromofluoromethane (Surr)	*86*		*78 - 129*		*02/25/21 14:52*	*1*

Lab Sample ID: LCS 240-474500/4
Matrix: Water
Analysis Batch: 474500

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.93		ug/L		89	73 - 129
cis-1,2-Dichloroethene	10.0	9.08		ug/L		91	75 - 124
Tetrachloroethene	10.0	9.68		ug/L		97	70 - 125
trans-1,2-Dichloroethene	10.0	9.29		ug/L		93	74 - 130
Trichloroethene	10.0	8.87		ug/L		89	71 - 121
Vinyl chloride	10.0	10.7		ug/L		107	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*75 - 130*
4-Bromofluorobenzene (Surr)	*101*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*86*		*78 - 129*

Lab Sample ID: 240-144661-D-2 MS
Matrix: Water
Analysis Batch: 474500

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,2-Dichloroethene	1.0	U	10.0	8.81		ug/L		88	68 - 121
Tetrachloroethene	1.0	U	10.0	8.35		ug/L		84	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	8.36		ug/L		84	69 - 126
Trichloroethene	1.0	U	10.0	8.22		ug/L		82	56 - 124
Vinyl chloride	20		10.0	30.2		ug/L		102	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*
4-Bromofluorobenzene (Surr)	*99*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*86*		*78 - 129*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144661-E-2 MSD
Matrix: Water
Analysis Batch: 474500

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
cis-1,2-Dichloroethene	1.0	U	10.0	8.80		ug/L		88	68 - 121	0	35
Tetrachloroethene	1.0	U	10.0	8.53		ug/L		85	52 - 129	2	35
trans-1,2-Dichloroethene	1.0	U	10.0	8.64		ug/L		86	69 - 126	3	35
Trichloroethene	1.0	U	10.0	8.36		ug/L		84	56 - 124	2	35
Vinyl chloride	20		10.0	29.8		ug/L		98	49 - 136	1	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*
4-Bromofluorobenzene (Surr)	*99*		*47 - 134*
Toluene-d8 (Surr)	*94*		*69 - 122*
Dibromofluoromethane (Surr)	*87*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474490/5
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 12:43	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/25/21 12:43*	*1*

Lab Sample ID: LCS 240-474490/4
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.7		ug/L		107	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*

Lab Sample ID: 240-144568-J-3 MS
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	10.2		ug/L		102	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144568-J-3 MSD
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.2		ug/L		102	46 - 170	0	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*

GC/MS VOA

Analysis Batch: 474490

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144658-2	MW-154S_021721	Total/NA	Water	8260B SIM	
MB 240-474490/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474490/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144568-J-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144568-J-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474500

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144658-1	TRIP BLANK	Total/NA	Water	8260B	
240-144658-2	MW-154S_021721	Total/NA	Water	8260B	
MB 240-474500/7	Method Blank	Total/NA	Water	8260B	
LCS 240-474500/4	Lab Control Sample	Total/NA	Water	8260B	
240-144661-D-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144661-E-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144658-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144658-1

Date Collected: 02/17/21 00:00

Matrix: Water

Date Received: 02/19/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474500	02/25/21 20:16	LRW	TAL CAN

Client Sample ID: MW-154S_021721

Lab Sample ID: 240-144658-2

Date Collected: 02/17/21 13:42

Matrix: Water

Date Received: 02/19/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474500	02/25/21 21:07	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474490	02/25/21 15:39	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144658-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190

TestAmerica — THE LEADER IN ENVIRONMENTAL TESTING

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Kara Donahue		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

COC No:

of COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below: 10 day ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day

Sample Identification	Sample Date	Sample Time	Matrix: Air	Matrix: Aqueous	Matrix: Sediment	Matrix: Solid	Matrix: Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite-C / Grab-G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM					Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X					1 Trip Blank
MW-154S_021721	2/17/21	1342		6						6					N	G	X	X	X	X	X	X	X					3 VOAs for 8260B 3 VOAs for 8260B SIM

240-144658 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Kara Donahue	Arcadis	2/17/21 1705	Novi Cold Storage	Arcadis	2/17/21 1705
[signature]	Arcadis	2/18/2021	[signature]	ETA	2/18/21 1018
[signature]	ETA	2/18/21 11:38	Received in Laboratory by: [signature]	TA	2-19-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 144658
Canton Facility

Client Arcadis Site Name

Cooler unpacked by:

Cooler Received on 2-19-21 Opened on 2-19-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.4 °C Corrected Cooler Temp. 1.5 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
   -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? Yes No
11. Sufficient quantity received to perform indicated analyses? Yes No
12. Are these work share samples and all listed on the COC? Yes No
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC907861
14. Were VOAs on the COC? Yes No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this. Yes No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # Yes No
17. Was a LL Hg or Me Hg trip blank present? Yes No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container.
Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.
Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

DATA VERIFICATION REPORT

March 05, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144658-1
Sample date: 2021-02-17
Report received by CADENA: 2021-03-05
Initial Data Verification completed by CADENA: 2021-03-05
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC TRIP blank had a detection below the RL for the following analyte: TRICHLOROETHENE. Qualification of client sample results was not required based on these TRIP blank detections.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144658-1

		Sample Name:	TRIP BLANK				MW-154S_021721			
		Lab Sample ID:	2401446581				2401446582			
		Sample Date:	2/17/2021				2/17/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	0.20	1.0	ug/l	J	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

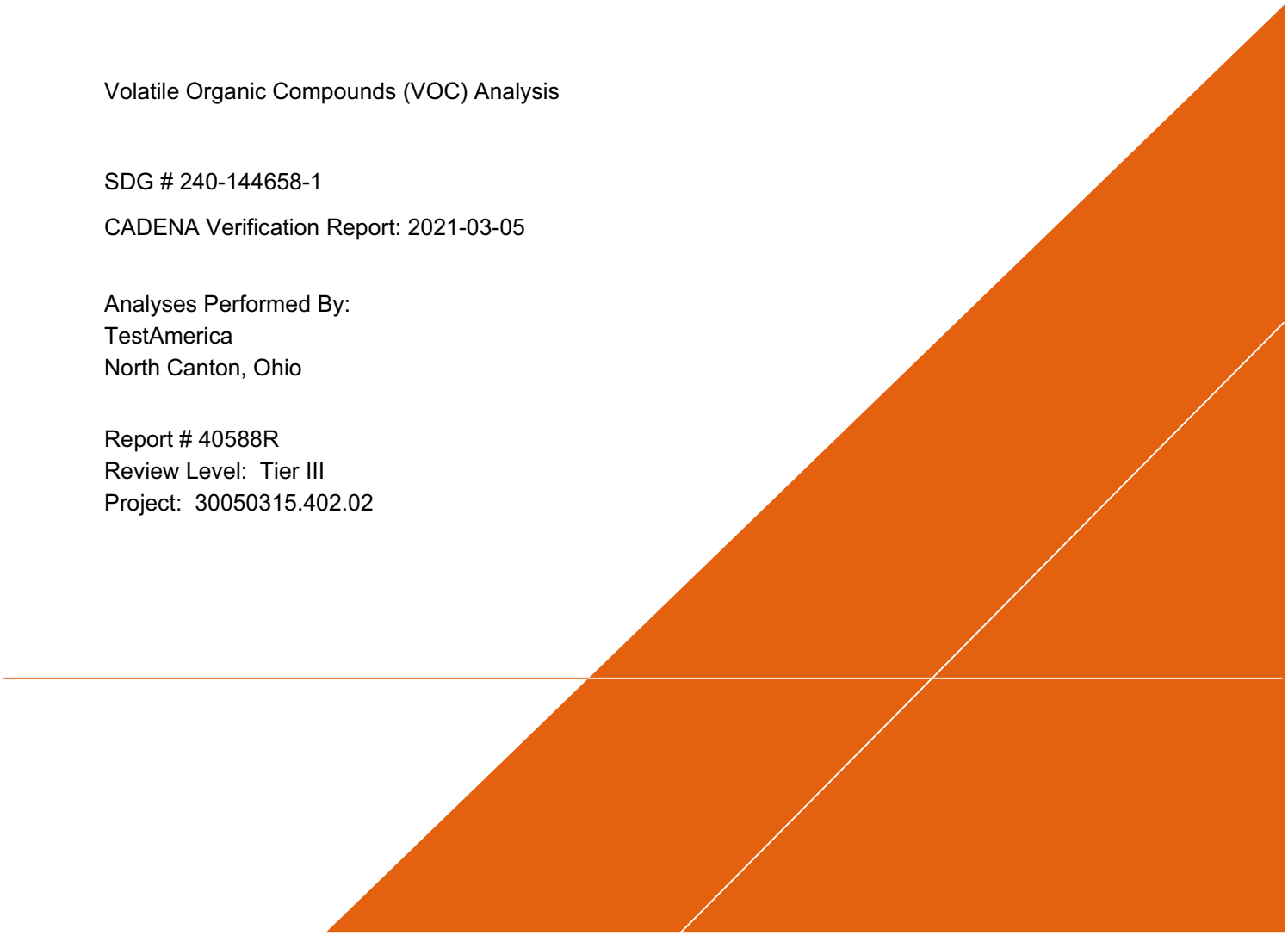
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144658-1

CADENA Verification Report: 2021-03-05

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40588R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144658-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144658-1	Water	02/17/2021		X	
MW-154S_021721	240-144658-2	Water	02/17/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 17, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 18, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190

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TestAmerica Laboratories, Inc.

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				of COCs
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Karen Donahue	TAT if different from below: 10 day; ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling:
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM				Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X				1 Trip Blank
MW-154S_021721	2/17/21	1342		6						6					N	G	X	X	X	X	X	X	X				3 VOAs for 8260B 3 VOAs for 8260B SIM

240-144658 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Karen Donahue	Arcadis	2/17/21 1705	Novi Cold Storage	Arcadis	2/17/21 1705
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Arcadis	2/18/2021		ETA	2/18/21 1038
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
	ETA	2/18/21 1138		TA	2-19-21 800

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144658-1

Date Collected: 02/17/21 00:00
Matrix: Water
Date Received: 02/19/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 20:16	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 20:16	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 20:16	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 20:16	1
Trichloroethene	**0.20**	**J**	1.0	0.10	ug/L			02/25/21 20:16	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 20:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*75 - 130*		*02/25/21 20:16*	*1*
4-Bromofluorobenzene (Surr)	*100*		*47 - 134*		*02/25/21 20:16*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*02/25/21 20:16*	*1*
Dibromofluoromethane (Surr)	*85*		*78 - 129*		*02/25/21 20:16*	*1*

Client Sample ID: MW-154S_021721
Lab Sample ID: 240-144658-2

Date Collected: 02/17/21 13:42
Matrix: Water
Date Received: 02/19/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 15:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*		*02/25/21 15:39*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 21:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 21:07	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 21:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 21:07	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 21:07	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 21:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*75 - 130*		*02/25/21 21:07*	*1*
4-Bromofluorobenzene (Surr)	*100*		*47 - 134*		*02/25/21 21:07*	*1*
Toluene-d8 (Surr)	*96*		*69 - 122*		*02/25/21 21:07*	*1*
Dibromofluoromethane (Surr)	*85*		*78 - 129*		*02/25/21 21:07*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144908-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/11/2021 4:30:28 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144908-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144908-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144908-1

Comments
No additional comments.

Receipt
The samples were received on 2/25/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.7° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144908-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144908-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144908-1	TRIP BLANK	Water	02/23/21 00:00	02/25/21 08:00	
240-144908-2	MW-182S_022321	Water	02/23/21 09:32	02/25/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144908-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144908-1

No Detections.

Client Sample ID: MW-182S_022321 — Lab Sample ID: 240-144908-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144908-1

Client Sample ID: TRIP BLANK
Date Collected: 02/23/21 00:00
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144908-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 13:55	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 13:55	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 13:55	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 13:55	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 13:55	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 13:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*03/02/21 13:55*	*1*
4-Bromofluorobenzene (Surr)	*84*		*47 - 134*		*03/02/21 13:55*	*1*
Toluene-d8 (Surr)	*95*		*69 - 122*		*03/02/21 13:55*	*1*
Dibromofluoromethane (Surr)	*97*		*78 - 129*		*03/02/21 13:55*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144908-1

Client Sample ID: MW-182S_022321

Date Collected: 02/23/21 09:32
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144908-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 15:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 133*		*03/02/21 15:45*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 14:17	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 14:17	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 14:17	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 14:17	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 14:17	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 14:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*03/02/21 14:17*	*1*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*		*03/02/21 14:17*	*1*
Toluene-d8 (Surr)	*96*		*69 - 122*		*03/02/21 14:17*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*03/02/21 14:17*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144908-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144718-C-13 MS	Matrix Spike	97	95	99	99
240-144718-C-13 MSD	Matrix Spike Duplicate	97	89	97	99
240-144908-1	TRIP BLANK	101	84	95	97
240-144908-2	MW-182S_022321	100	89	96	98
LCS 240-475001/4	Lab Control Sample	92	88	92	97
MB 240-475001/6	Method Blank	100	85	95	99

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144908-2	MW-182S_022321	94
240-145076-O-2 MS	Matrix Spike	94
240-145076-O-2 MSD	Matrix Spike Duplicate	91
LCS 240-475052/4	Lab Control Sample	88
MB 240-475052/5	Method Blank	87

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475001/6
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 11:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 11:19	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 11:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 11:19	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 11:19	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 11:19	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*03/02/21 11:19*	*1*
4-Bromofluorobenzene (Surr)	*85*		*47 - 134*		*03/02/21 11:19*	*1*
Toluene-d8 (Surr)	*95*		*69 - 122*		*03/02/21 11:19*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*03/02/21 11:19*	*1*

Lab Sample ID: LCS 240-475001/4
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.92		ug/L		89	73 - 129
cis-1,2-Dichloroethene	10.0	9.98		ug/L		100	75 - 124
Tetrachloroethene	10.0	9.61		ug/L		96	70 - 125
trans-1,2-Dichloroethene	10.0	9.73		ug/L		97	74 - 130
Trichloroethene	10.0	9.44		ug/L		94	71 - 121
Vinyl chloride	10.0	9.30		ug/L		93	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*
Toluene-d8 (Surr)	*92*		*69 - 122*
Dibromofluoromethane (Surr)	*97*		*78 - 129*

Lab Sample ID: 240-144718-C-13 MS
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25	U	250	217		ug/L		87	64 - 132
cis-1,2-Dichloroethene	25	U	250	230		ug/L		92	68 - 121
Tetrachloroethene	5.3	J	250	231		ug/L		90	52 - 129
trans-1,2-Dichloroethene	25	U	250	224		ug/L		90	69 - 126
Trichloroethene	510		250	655		ug/L		57	56 - 124
Vinyl chloride	25	U	250	208		ug/L		83	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*99*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144718-C-13 MS
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*99*		*78 - 129*

Lab Sample ID: 240-144718-C-13 MSD
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	25	U	250	236		ug/L		94	64 - 132	8	35
cis-1,2-Dichloroethene	25	U	250	241		ug/L		97	68 - 121	5	35
Tetrachloroethene	5.3	J	250	251		ug/L		98	52 - 129	9	35
trans-1,2-Dichloroethene	25	U	250	236		ug/L		94	69 - 126	5	35
Trichloroethene	510		250	728		ug/L		86	56 - 124	11	35
Vinyl chloride	25	U	250	256		ug/L		103	49 - 136	21	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*
Toluene-d8 (Surr)	*97*		*69 - 122*
Dibromofluoromethane (Surr)	*99*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475052/5
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 12:26	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*70 - 133*		*03/02/21 12:26*	*1*

Lab Sample ID: LCS 240-475052/4
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.00		ug/L		90	80 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 133*

Lab Sample ID: 240-145076-O-2 MS
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	9.73		ug/L		97	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 133*

Lab Sample ID: 240-145076-O-2 MSD
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.82		ug/L		98	46 - 170	1	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*91*		*70 - 133*

GC/MS VOA

Analysis Batch: 475001

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144908-1	TRIP BLANK	Total/NA	Water	8260B	
240-144908-2	MW-182S_022321	Total/NA	Water	8260B	
MB 240-475001/6	Method Blank	Total/NA	Water	8260B	
LCS 240-475001/4	Lab Control Sample	Total/NA	Water	8260B	
240-144718-C-13 MS	Matrix Spike	Total/NA	Water	8260B	
240-144718-C-13 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 475052

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144908-2	MW-182S_022321	Total/NA	Water	8260B SIM	
MB 240-475052/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-475052/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-145076-O-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-145076-O-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144908-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144908-1

Date Collected: 02/23/21 00:00

Matrix: Water

Date Received: 02/25/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475001	03/02/21 13:55	LEE	TAL CAN

Client Sample ID: MW-182S_022321

Lab Sample ID: 240-144908-2

Date Collected: 02/23/21 09:32

Matrix: Water

Date Received: 02/25/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475001	03/02/21 14:17	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	475052	03/02/21 15:45	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144908-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

2/6/27

Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica MICHIGAN 190

TestAmerica Laboratories, Inc.

Regulatory program: DW NPDES RCRA Other

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Allyson Hurtz	TAT if different from below: 10 day; 3 weeks / 2 weeks / 1 week / 2 days / 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 trip blank
MW-1825_022321	2/23/21	9:32		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B, 3 VOAs for 8260B SIM

240-144908 Chain of Custody

Possible Hazard Identification: Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / Disposal By Lab / Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Allyson Hurtz	Arcadis	2/23/21 16:30	Novi cold storage	Arcadis	2/23/21 16:30
Ruby McAffrey	Arcadis	2/24/2021	Amanda Battenhall	ETA	2/24/21 10:04
Amanda Battenhall	ETA	2/24/21 1404	Received in Laboratory by:	Company: 2-25-21 ETA	Date/Time: 2-25-21 800

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3/11/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 144908**
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Ryan C

Cooler Received on 2-25-21 Opened on 2-25-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2.6 °C Corrected Cooler Temp. 2.7 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 58306 (Yes) No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

March 11, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144908-1
Sample date: 2021-02-23
Report received by CADENA: 2021-03-11
Initial Data Verification completed by CADENA: 2021-03-11
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144908-1

		Sample Name:	TRIP BLANK				MW-182S_022321			
		Lab Sample ID:	2401449081				2401449082			
		Sample Date:	2/23/2021				2/23/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

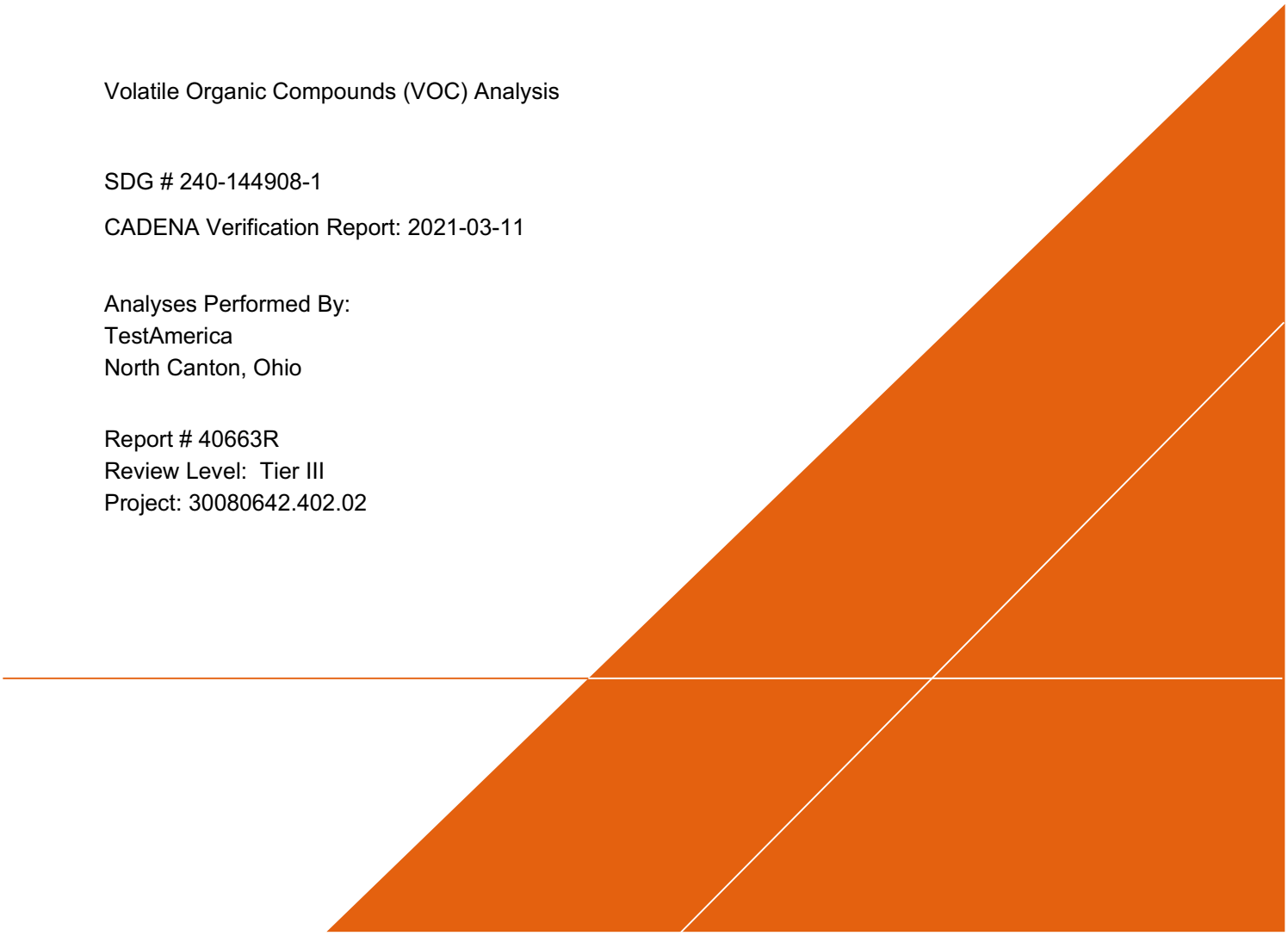
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144908-1

CADENA Verification Report: 2021-03-11

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40663R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144908-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144908-1	Water	02/23/2021		X	
MW-182S_022321	240-144908-2	Water	02/23/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 23, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 24, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

2/6/27

Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica MICHIGAN 190

TestAmerica Laboratories, Inc.

Regulatory program: DW NPDES RCRA Other

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Allyson Hurtz	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn/Ac/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 trip blank
MW-1825_022321	2/23/21	9:32		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B, 3 VOAs for 8260B SIM

240-144908 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Allyson Hurtz	Arcadis	2/23/21 16:30	Novi cold storage	Arcadis	2/23/21 16:30
Ruby McClafferty	Arcadis	2/24/2021	Amanda Battershell	ETA	2/24/21 10:04
Amanda Battershell	ETA	2/24/21 1404	Received in Laboratory by:	Company: ETA	Date/Time: 2-25-21 800

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8/11/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144908-1

Date Collected: 02/23/21 00:00
Matrix: Water
Date Received: 02/25/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 13:55	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 13:55	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 13:55	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 13:55	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 13:55	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 13:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*03/02/21 13:55*	*1*
4-Bromofluorobenzene (Surr)	*84*		*47 - 134*		*03/02/21 13:55*	*1*
Toluene-d8 (Surr)	*95*		*69 - 122*		*03/02/21 13:55*	*1*
Dibromofluoromethane (Surr)	*97*		*78 - 129*		*03/02/21 13:55*	*1*

Client Sample ID: MW-182S_022321
Lab Sample ID: 240-144908-2

Date Collected: 02/23/21 09:32
Matrix: Water
Date Received: 02/25/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 15:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 133*		*03/02/21 15:45*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 14:17	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 14:17	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 14:17	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 14:17	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 14:17	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 14:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*03/02/21 14:17*	*1*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*		*03/02/21 14:17*	*1*
Toluene-d8 (Surr)	*96*		*69 - 122*		*03/02/21 14:17*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*03/02/21 14:17*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144906-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/11/2021 4:29:01 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144906-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144906-1

Job ID: 240-144906-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144906-1

Comments
No additional comments.

Receipt
The samples were received on 2/25/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.7º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144906-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144906-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144906-1	TRIP BLANK	Water	02/23/21 00:00	02/25/21 08:00	
240-144906-2	MW-225S_022321	Water	02/23/21 10:40	02/25/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144906-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144906-1

No Detections.

Client Sample ID: MW-225S_022321 — Lab Sample ID: 240-144906-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144906-1

Client Sample ID: TRIP BLANK
Date Collected: 02/23/21 00:00
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144906-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 12:26	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 12:26	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 12:26	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 12:26	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 12:26	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 12:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*03/02/21 12:26*	*1*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*		*03/02/21 12:26*	*1*
Toluene-d8 (Surr)	*99*		*69 - 122*		*03/02/21 12:26*	*1*
Dibromofluoromethane (Surr)	*100*		*78 - 129*		*03/02/21 12:26*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144906-1

Client Sample ID: MW-225S_022321
Date Collected: 02/23/21 10:40
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144906-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 14:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 133*		*03/02/21 14:55*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 12:48	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 12:48	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 12:48	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 12:48	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 12:48	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 12:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*107*		*75 - 130*		*03/02/21 12:48*	*1*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*		*03/02/21 12:48*	*1*
Toluene-d8 (Surr)	*100*		*69 - 122*		*03/02/21 12:48*	*1*
Dibromofluoromethane (Surr)	*104*		*78 - 129*		*03/02/21 12:48*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144906-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144718-C-13 MS	Matrix Spike	97	95	99	99
240-144718-C-13 MSD	Matrix Spike Duplicate	97	89	97	99
240-144906-1	TRIP BLANK	101	88	99	100
240-144906-2	MW-225S_022321	107	91	100	104
LCS 240-475001/4	Lab Control Sample	92	88	92	97
MB 240-475001/6	Method Blank	100	85	95	99

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144906-2	MW-225S_022321	94
240-145076-O-2 MS	Matrix Spike	94
240-145076-O-2 MSD	Matrix Spike Duplicate	91
LCS 240-475052/4	Lab Control Sample	88
MB 240-475052/5	Method Blank	87

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475001/6
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 11:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 11:19	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 11:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 11:19	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 11:19	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 11:19	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*03/02/21 11:19*	*1*
4-Bromofluorobenzene (Surr)	*85*		*47 - 134*		*03/02/21 11:19*	*1*
Toluene-d8 (Surr)	*95*		*69 - 122*		*03/02/21 11:19*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*03/02/21 11:19*	*1*

Lab Sample ID: LCS 240-475001/4
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.92		ug/L		89	73 - 129
cis-1,2-Dichloroethene	10.0	9.98		ug/L		100	75 - 124
Tetrachloroethene	10.0	9.61		ug/L		96	70 - 125
trans-1,2-Dichloroethene	10.0	9.73		ug/L		97	74 - 130
Trichloroethene	10.0	9.44		ug/L		94	71 - 121
Vinyl chloride	10.0	9.30		ug/L		93	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*
Toluene-d8 (Surr)	*92*		*69 - 122*
Dibromofluoromethane (Surr)	*97*		*78 - 129*

Lab Sample ID: 240-144718-C-13 MS
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25	U	250	217		ug/L		87	64 - 132
cis-1,2-Dichloroethene	25	U	250	230		ug/L		92	68 - 121
Tetrachloroethene	5.3	J	250	231		ug/L		90	52 - 129
trans-1,2-Dichloroethene	25	U	250	224		ug/L		90	69 - 126
Trichloroethene	510		250	655		ug/L		57	56 - 124
Vinyl chloride	25	U	250	208		ug/L		83	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*99*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144718-C-13 MS
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*99*		*78 - 129*

Lab Sample ID: 240-144718-C-13 MSD
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	25	U	250	236		ug/L		94	64 - 132	8	35
cis-1,2-Dichloroethene	25	U	250	241		ug/L		97	68 - 121	5	35
Tetrachloroethene	5.3	J	250	251		ug/L		98	52 - 129	9	35
trans-1,2-Dichloroethene	25	U	250	236		ug/L		94	69 - 126	5	35
Trichloroethene	510		250	728		ug/L		86	56 - 124	11	35
Vinyl chloride	25	U	250	256		ug/L		103	49 - 136	21	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*
Toluene-d8 (Surr)	*97*		*69 - 122*
Dibromofluoromethane (Surr)	*99*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475052/5
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 12:26	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*70 - 133*		*03/02/21 12:26*	*1*

Lab Sample ID: LCS 240-475052/4
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.00		ug/L		90	80 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 133*

Lab Sample ID: 240-145076-O-2 MS
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	9.73		ug/L		97	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 133*

Lab Sample ID: 240-145076-O-2 MSD
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.82		ug/L		98	46 - 170	1	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*91*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144906-1

GC/MS VOA

Analysis Batch: 475001

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144906-1	TRIP BLANK	Total/NA	Water	8260B	
240-144906-2	MW-225S_022321	Total/NA	Water	8260B	
MB 240-475001/6	Method Blank	Total/NA	Water	8260B	
LCS 240-475001/4	Lab Control Sample	Total/NA	Water	8260B	
240-144718-C-13 MS	Matrix Spike	Total/NA	Water	8260B	
240-144718-C-13 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 475052

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144906-2	MW-225S_022321	Total/NA	Water	8260B SIM	
MB 240-475052/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-475052/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-145076-O-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-145076-O-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144906-1

Client Sample ID: TRIP BLANK
Date Collected: 02/23/21 00:00
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144906-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475001	03/02/21 12:26	LEE	TAL CAN

Client Sample ID: MW-225S_022321
Date Collected: 02/23/21 10:40
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144906-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475001	03/02/21 12:48	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	475052	03/02/21 14:55	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144906-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

TestAmerica MICHIGAN 190

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	/ of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Allyson Hartz	TAT if different from below: 10 day; ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	Trip blank
MW-225S_022321	2/23/21	10:40		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-144906 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Allyson Hartz	Arcadis	2/23/21 16:30	Novi cold storage	Arcadis	2/23/21 16:30
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Arcadis	2/24/2021	Amanda Battershell	ETA	2/24/21 10:04
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
Amanda Battershell	ETA	2/24/21 1404		TA	2.25.21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 144906
Canton Facility

Client Arcadis Site Name

Cooler unpacked by: Ryan C

Cooler Received on 2-25-21 Opened on 2-25-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2.6 °C Corrected Cooler Temp. 2.7 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)? (Y) (Y) (Y)
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 58306 (Yes) No
17. Was a LL Hg or Me Hg trip blank present? ____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

WI-NC-099

DATA VERIFICATION REPORT

March 11, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144906-1
Sample date: 2021-02-23
Report received by CADENA: 2021-03-11
Initial Data Verification completed by CADENA: 2021-03-11
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144906-1

		Sample Name:	TRIP BLANK				MW-225S_022321			
		Lab Sample ID:	2401449061				2401449062			
		Sample Date:	2/23/2021				2/23/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

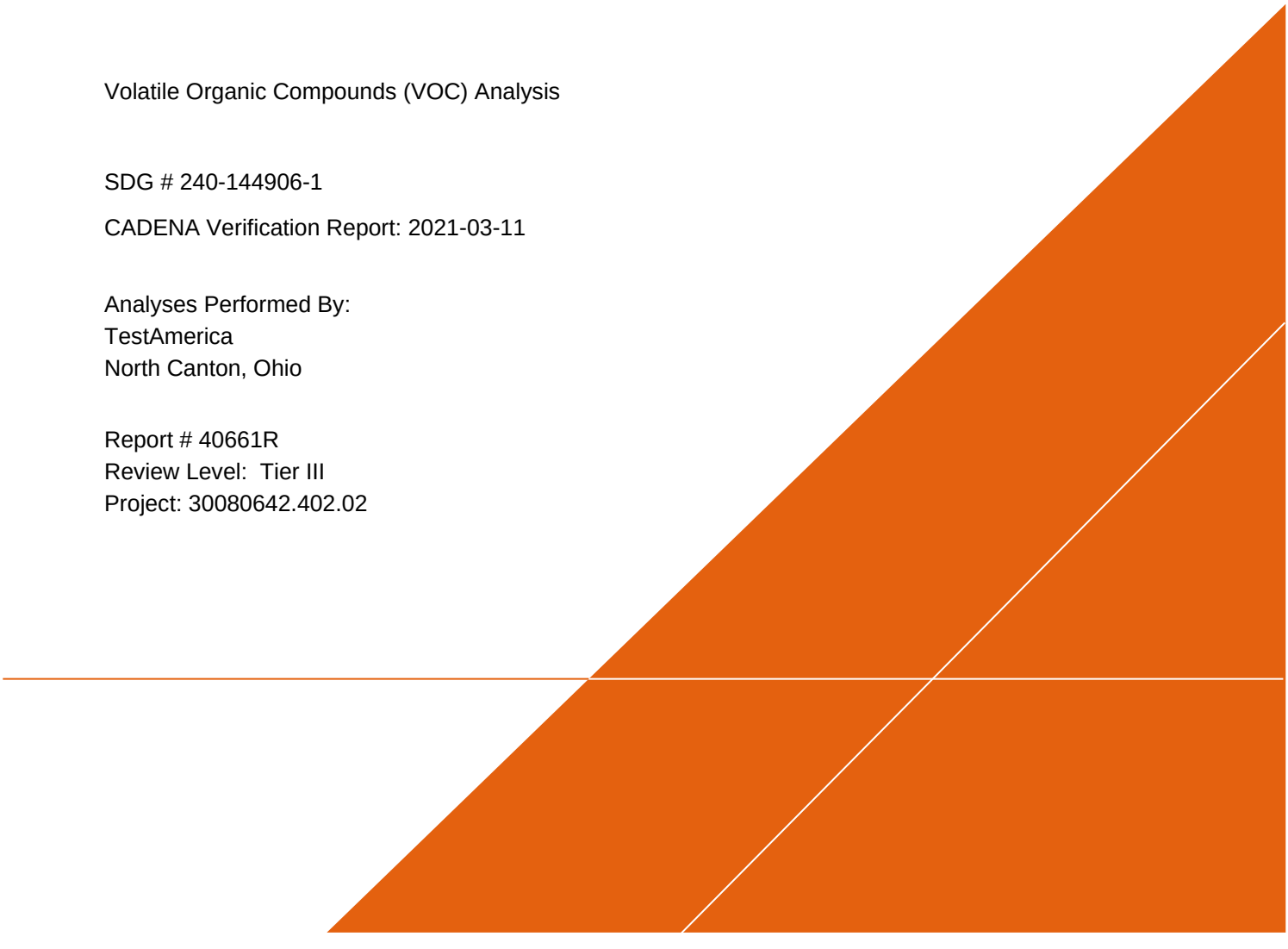
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144906-1

CADENA Verification Report: 2021-03-11

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40661R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144906-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144906-1	Water	02/23/2021		X	
MW-225S_022321	240-144906-2	Water	02/23/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

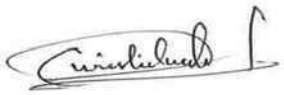
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 23, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 24, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica MICHIGAN 190

TestAmerica Laboratory location: Brighton – 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other			COC No:
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	/ of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Allyson Hartz	TAT if different from below: 10 day; ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client; Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	Trip blank
MW-225_022321	2/23/21	10:40		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-144906 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Allyson Hartz	Arcadis	2/23/21 16:30	Novi Cold Storage	Arcadis	2/23/21 16:30
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Arcadis	2/24/2021	Amanda Battershell	ETA	2/24/21 10:04
Relinquished by: Amanda Battershell	Company: ETA	Date/Time: 2/24/21 1404	Received in Laboratory by:	Company: TA	Date/Time: 2-25-21 800

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144906-1
Date Collected: 02/23/21 00:00
Matrix: Water
Date Received: 02/25/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 12:26	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 12:26	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 12:26	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 12:26	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 12:26	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 12:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*03/02/21 12:26*	*1*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*		*03/02/21 12:26*	*1*
Toluene-d8 (Surr)	*99*		*69 - 122*		*03/02/21 12:26*	*1*
Dibromofluoromethane (Surr)	*100*		*78 - 129*		*03/02/21 12:26*	*1*

Client Sample ID: MW-225S_022321
Lab Sample ID: 240-144906-2
Date Collected: 02/23/21 10:40
Matrix: Water
Date Received: 02/25/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 14:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 133*		*03/02/21 14:55*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 12:48	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 12:48	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 12:48	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 12:48	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 12:48	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 12:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*107*		*75 - 130*		*03/02/21 12:48*	*1*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*		*03/02/21 12:48*	*1*
Toluene-d8 (Surr)	*100*		*69 - 122*		*03/02/21 12:48*	*1*
Dibromofluoromethane (Surr)	*104*		*78 - 129*		*03/02/21 12:48*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144915-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/25/2021 3:53:42 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144915-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144915-1

Job ID: 240-144915-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144915-1

Comments
No additional comments.

Receipt
The samples were received on 2/25/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.7º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144915-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144915-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144915-1	TRIP BLANK	Water	02/23/21 00:00	02/25/21 08:00	
240-144915-2	MW-110S_022321	Water	02/23/21 15:15	02/25/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144915-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144915-1

No Detections.

Client Sample ID: MW-110S_022321 — Lab Sample ID: 240-144915-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144915-1

Client Sample ID: TRIP BLANK
Date Collected: 02/23/21 00:00
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144915-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U H	1.0	0.19	ug/L			03/11/21 15:34	1
cis-1,2-Dichloroethene	1.0	U H	1.0	0.16	ug/L			03/11/21 15:34	1
Tetrachloroethene	1.0	U H	1.0	0.15	ug/L			03/11/21 15:34	1
trans-1,2-Dichloroethene	1.0	U H	1.0	0.19	ug/L			03/11/21 15:34	1
Trichloroethene	1.0	U H	1.0	0.10	ug/L			03/11/21 15:34	1
Vinyl chloride	1.0	U H	1.0	0.20	ug/L			03/11/21 15:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*75 - 130*		*03/11/21 15:34*	*1*
4-Bromofluorobenzene (Surr)	*94*		*47 - 134*		*03/11/21 15:34*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*03/11/21 15:34*	*1*
Dibromofluoromethane (Surr)	*87*		*78 - 129*		*03/11/21 15:34*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144915-1

Client Sample ID: MW-110S_022321
Date Collected: 02/23/21 15:15
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144915-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 18:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*70 - 133*		*03/02/21 18:15*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 18:42	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 18:42	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 18:42	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 18:42	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 18:42	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 18:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 130*		*03/02/21 18:42*	*1*
4-Bromofluorobenzene (Surr)	*78*		*47 - 134*		*03/02/21 18:42*	*1*
Toluene-d8 (Surr)	*91*		*69 - 122*		*03/02/21 18:42*	*1*
Dibromofluoromethane (Surr)	*97*		*78 - 129*		*03/02/21 18:42*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144915-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144718-C-13 MS	Matrix Spike	97	95	99	99
240-144718-C-13 MSD	Matrix Spike Duplicate	97	89	97	99
240-144915-1	TRIP BLANK	83	94	93	87
240-144915-2	MW-110S_022321	98	78	91	97
LCS 240-475001/4	Lab Control Sample	92	88	92	97
LCS 240-476417/4	Lab Control Sample	82	97	94	89
MB 240-475001/6	Method Blank	100	85	95	99
MB 240-476417/7	Method Blank	79	97	94	87

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144915-2	MW-110S_022321	93
240-145076-O-2 MS	Matrix Spike	94
240-145076-O-2 MSD	Matrix Spike Duplicate	91
LCS 240-475052/4	Lab Control Sample	88
MB 240-475052/5	Method Blank	87

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475001/6
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 11:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 11:19	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 11:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 11:19	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 11:19	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 11:19	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*03/02/21 11:19*	*1*
4-Bromofluorobenzene (Surr)	*85*		*47 - 134*		*03/02/21 11:19*	*1*
Toluene-d8 (Surr)	*95*		*69 - 122*		*03/02/21 11:19*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*03/02/21 11:19*	*1*

Lab Sample ID: LCS 240-475001/4
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.92		ug/L		89	73 - 129
cis-1,2-Dichloroethene	10.0	9.98		ug/L		100	75 - 124
Tetrachloroethene	10.0	9.61		ug/L		96	70 - 125
trans-1,2-Dichloroethene	10.0	9.73		ug/L		97	74 - 130
Trichloroethene	10.0	9.44		ug/L		94	71 - 121
Vinyl chloride	10.0	9.30		ug/L		93	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*
Toluene-d8 (Surr)	*92*		*69 - 122*
Dibromofluoromethane (Surr)	*97*		*78 - 129*

Lab Sample ID: 240-144718-C-13 MS
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25	U	250	217		ug/L		87	64 - 132
cis-1,2-Dichloroethene	25	U	250	230		ug/L		92	68 - 121
Tetrachloroethene	5.3	J	250	231		ug/L		90	52 - 129
trans-1,2-Dichloroethene	25	U	250	224		ug/L		90	69 - 126
Trichloroethene	510		250	655		ug/L		57	56 - 124
Vinyl chloride	25	U	250	208		ug/L		83	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*99*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144718-C-13 MS
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	99		78 - 129

Lab Sample ID: 240-144718-C-13 MSD
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	25	U	250	236		ug/L		94	64 - 132	8	35
cis-1,2-Dichloroethene	25	U	250	241		ug/L		97	68 - 121	5	35
Tetrachloroethene	5.3	J	250	251		ug/L		98	52 - 129	9	35
trans-1,2-Dichloroethene	25	U	250	236		ug/L		94	69 - 126	5	35
Trichloroethene	510		250	728		ug/L		86	56 - 124	11	35
Vinyl chloride	25	U	250	256		ug/L		103	49 - 136	21	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	97		75 - 130
4-Bromofluorobenzene (Surr)	89		47 - 134
Toluene-d8 (Surr)	97		69 - 122
Dibromofluoromethane (Surr)	99		78 - 129

Lab Sample ID: MB 240-476417/7
Matrix: Water
Analysis Batch: 476417

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/11/21 14:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/11/21 14:19	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/11/21 14:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/11/21 14:19	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/11/21 14:19	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/11/21 14:19	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	79		75 - 130		03/11/21 14:19	1
4-Bromofluorobenzene (Surr)	97		47 - 134		03/11/21 14:19	1
Toluene-d8 (Surr)	94		69 - 122		03/11/21 14:19	1
Dibromofluoromethane (Surr)	87		78 - 129		03/11/21 14:19	1

Lab Sample ID: LCS 240-476417/4
Matrix: Water
Analysis Batch: 476417

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.68		ug/L		87	73 - 129
cis-1,2-Dichloroethene	10.0	9.28		ug/L		93	75 - 124
Tetrachloroethene	10.0	9.89		ug/L		99	70 - 125
trans-1,2-Dichloroethene	10.0	9.06		ug/L		91	74 - 130
Trichloroethene	10.0	8.69		ug/L		87	71 - 121

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-476417/4
Matrix: Water
Analysis Batch: 476417

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Vinyl chloride			10.0	11.1		ug/L		111	61 - 134		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*75 - 130*
4-Bromofluorobenzene (Surr)	*97*		*47 - 134*
Toluene-d8 (Surr)	*94*		*69 - 122*
Dibromofluoromethane (Surr)	*89*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475052/5
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 12:26	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*70 - 133*		*03/02/21 12:26*	*1*

Lab Sample ID: LCS 240-475052/4
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	9.00		ug/L		90	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 133*

Lab Sample ID: 240-145076-O-2 MS
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	9.73		ug/L		97	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 133*

Lab Sample ID: 240-145076-O-2 MSD
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.82		ug/L		98	46 - 170	1	26

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-145076-O-2 MSD
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*91*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144915-1

GC/MS VOA

Analysis Batch: 475001

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144915-2	MW-110S_022321	Total/NA	Water	8260B	
MB 240-475001/6	Method Blank	Total/NA	Water	8260B	
LCS 240-475001/4	Lab Control Sample	Total/NA	Water	8260B	
240-144718-C-13 MS	Matrix Spike	Total/NA	Water	8260B	
240-144718-C-13 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 475052

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144915-2	MW-110S_022321	Total/NA	Water	8260B SIM	
MB 240-475052/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-475052/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-145076-O-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-145076-O-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 476417

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144915-1	TRIP BLANK	Total/NA	Water	8260B	
MB 240-476417/7	Method Blank	Total/NA	Water	8260B	
LCS 240-476417/4	Lab Control Sample	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144915-1

Client Sample ID: TRIP BLANK
Date Collected: 02/23/21 00:00
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144915-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	476417	03/11/21 15:34	LRW	TAL CAN

Client Sample ID: MW-110S_022321
Date Collected: 02/23/21 15:15
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144915-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475001	03/02/21 18:42	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	475052	03/02/21 18:15	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144915-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

TestAmerica MICHIGAN 190

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810229-2763

TestAmerica Laboratories, Inc.

Regulatory program: DW NPDES RCRA Other

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client; Lab sampling; Job/SDG No:
Phone: 248-994-2240	Method of Shipment/Carrier:			
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-110S_022321	2/23/21	1515		6						6					N	G	X	X	X	X	X	X	X	3 vocs for 8260B; 3 vocs for 8260B SIM

240-144915 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Emma Witherspoon	Arcadis	2/23/21 1800	ADU, cold storage	Arcadis	2/23/21 1800
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Julia McClafferty	Arcadis	2/24/2021	Amanda Battenhill	ETA	2/24/21 1004
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
Amanda Battenhill	ETA	2/24/21 1404		TA	2-25-21 800

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3/25/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 144915
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Ryan C

Cooler Received on 2-25-21 Opened on 2-25-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2.6 °C Corrected Cooler Temp. 2.7 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 59072 (Yes) No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

March 25, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144915-1
Sample date: 2021-02-23
Report received by CADENA: 2021-03-25
Initial Data Verification completed by CADENA: 2021-03-25
Number of Samples:2
Sample Matrices:Water and trip blank
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

HTQ - Sample result should be considered to be estimated and qualified with a J flag if detected and UJ flag if non-detect.
Client sample was received/prepped/analyzed outside of the referenced holding time for the noted test:
GCMS VOC sample -001 (trip blank) - UJ flags.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Qualifiers added during verification have been added to the electronic data which is available for download from the CADENA CLMS. Refer to the attached table of analytical results that have been qualified during verification.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Qualified Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144915-1

Sample Name: TRIP BLANK
Lab Sample ID: 2401449151
Sample Date: 2/23/2021

Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC					
OSW-8260B					
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	UJ
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	UJ
Tetrachloroethene	127-18-4	ND	1.0	ug/l	UJ
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	UJ
Trichloroethene	79-01-6	ND	1.0	ug/l	UJ
Vinyl chloride	75-01-4	ND	1.0	ug/l	UJ

Analytical Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144915-1

		Sample Name:	TRIP BLANK				MW-110S_022321			
		Lab Sample ID:	2401449151				2401449152			
		Sample Date:	2/23/2021				2/23/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

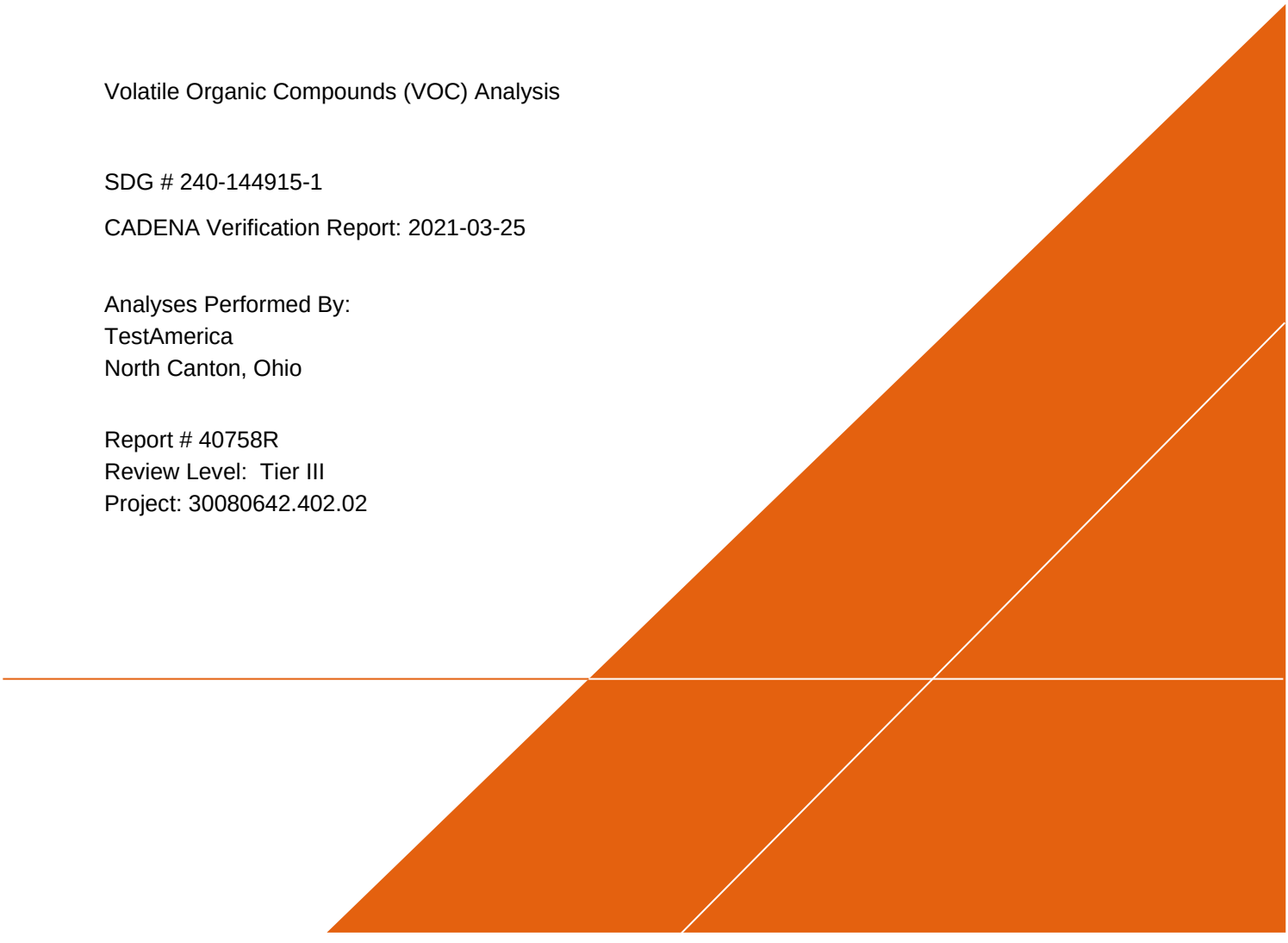
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144915-1

CADENA Verification Report: 2021-03-25

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40758R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144915-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144915-1	Water	02/23/2021		X	
MW-110S_022421	240-144915-2	Water	02/23/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

The analyses that exceeded the holding are presented in the following table.

Sample ID	Analytical method	Holding Time	Criteria
TRIP BLANK	SW-846 8260B	16 Days	14 days from collection to analysis

Sample results associated with sample locations analyzed by analytical method SW-846 8260 were qualified, as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

DATA REVIEW

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X	X		
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

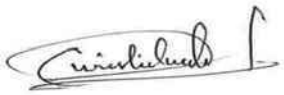
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 27, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 29, 2021

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica MICHIGAN 190

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Regulatory program: DW NPDES RCRA Other

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client; Lab sampling
Phone: 248-994-2240	Method of Shipment/Carrier:			Job/SDG No:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 trip blank
MW-110S_022321	2/23/21	1515		6						6					N	G	X	X	X	X	X	X	X	3 vocs for 8260B; 3vocs for 8260B SIM

240-144915 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Emma Witherspoon	Arcadis	2/23/21 1800	ABV1 gold storage	Arcadis	2/23/21 1800
Julia McClafferty	Arcadis	2/24/2021	Amanda Battershell	ETA	2/24/21 1004
Amanda Battershell	ETA	2/24/21 1404	Received in Laboratory by:	TA	2-25-21 800

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144915-1
Date Collected: 02/23/21 00:00
Matrix: Water
Date Received: 02/25/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U H	UJ	1.0	0.19	ug/L			03/11/21 15:34	1
cis-1,2-Dichloroethene	1.0	U H	UJ	1.0	0.16	ug/L			03/11/21 15:34	1
Tetrachloroethene	1.0	U H	UJ	1.0	0.15	ug/L			03/11/21 15:34	1
trans-1,2-Dichloroethene	1.0	U H	UJ	1.0	0.19	ug/L			03/11/21 15:34	1
Trichloroethene	1.0	U H	UJ	1.0	0.10	ug/L			03/11/21 15:34	1
Vinyl chloride	1.0	U H	UJ	1.0	0.20	ug/L			03/11/21 15:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*75 - 130*		*03/11/21 15:34*	*1*
4-Bromofluorobenzene (Surr)	*94*		*47 - 134*		*03/11/21 15:34*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*03/11/21 15:34*	*1*
Dibromofluoromethane (Surr)	*87*		*78 - 129*		*03/11/21 15:34*	*1*

Client Sample ID: MW-110S_022321
Lab Sample ID: 240-144915-2
Date Collected: 02/23/21 15:15
Matrix: Water
Date Received: 02/25/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 18:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*70 - 133*		*03/02/21 18:15*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 18:42	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 18:42	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 18:42	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 18:42	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 18:42	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 18:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 130*		*03/02/21 18:42*	*1*
4-Bromofluorobenzene (Surr)	*78*		*47 - 134*		*03/02/21 18:42*	*1*
Toluene-d8 (Surr)	*91*		*69 - 122*		*03/02/21 18:42*	*1*
Dibromofluoromethane (Surr)	*97*		*78 - 129*		*03/02/21 18:42*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-145140-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/12/2021 4:47:21 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
Review your project results through TotalAccess
Have a Question? Ask The Expert
Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145140-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145140-1

Job ID: 240-145140-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-145140-1

Comments
No additional comments.

Receipt
The samples were received on 2/27/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.9º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145140-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145140-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-145140-1	TRIP BLANK	Water	02/25/21 00:00	02/27/21 08:00	
240-145140-2	MW-216S_022521	Water	02/25/21 15:42	02/27/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145140-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-145140-1

No Detections.

Client Sample ID: MW-216S_022521 — Lab Sample ID: 240-145140-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145140-1

Client Sample ID: TRIP BLANK
Date Collected: 02/25/21 00:00
Date Received: 02/27/21 08:00

Lab Sample ID: 240-145140-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 18:28	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 18:28	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 18:28	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 18:28	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 18:28	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 18:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*75 - 130*		*03/03/21 18:28*	*1*
4-Bromofluorobenzene (Surr)	*75*		*47 - 134*		*03/03/21 18:28*	*1*
Toluene-d8 (Surr)	*86*		*69 - 122*		*03/03/21 18:28*	*1*
Dibromofluoromethane (Surr)	*118*		*78 - 129*		*03/03/21 18:28*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145140-1

Client Sample ID: MW-216S_022521
Date Collected: 02/25/21 15:42
Date Received: 02/27/21 08:00

Lab Sample ID: 240-145140-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/04/21 15:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*70 - 133*		*03/04/21 15:35*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 18:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 18:50	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 18:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 18:50	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 18:50	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 18:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*75 - 130*		*03/03/21 18:50*	*1*
4-Bromofluorobenzene (Surr)	*76*		*47 - 134*		*03/03/21 18:50*	*1*
Toluene-d8 (Surr)	*85*		*69 - 122*		*03/03/21 18:50*	*1*
Dibromofluoromethane (Surr)	*120*		*78 - 129*		*03/03/21 18:50*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145140-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144838-B-2 MS	Matrix Spike	89	98	95	107
240-144838-B-2 MSD	Matrix Spike Duplicate	85	96	93	101
240-145140-1	TRIP BLANK	103	75	86	118
240-145140-2	MW-216S_022521	103	76	85	120
LCS 240-475239/4	Lab Control Sample	87	95	93	103
MB 240-475239/7	Method Blank	92	79	88	103

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-145136-J-2 MS	Matrix Spike	85
240-145136-J-2 MSD	Matrix Spike Duplicate	86
240-145140-2	MW-216S_022521	89
LCS 240-475458/4	Lab Control Sample	84
MB 240-475458/5	Method Blank	87

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475239/7
Matrix: Water
Analysis Batch: 475239

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 11:11	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 11:11	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 11:11	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 11:11	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 11:11	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 11:11	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*		*03/03/21 11:11*	*1*
4-Bromofluorobenzene (Surr)	*79*		*47 - 134*		*03/03/21 11:11*	*1*
Toluene-d8 (Surr)	*88*		*69 - 122*		*03/03/21 11:11*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*03/03/21 11:11*	*1*

Lab Sample ID: LCS 240-475239/4
Matrix: Water
Analysis Batch: 475239

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	12.8		ug/L		128	73 - 129
cis-1,2-Dichloroethene	10.0	11.1		ug/L		111	75 - 124
Tetrachloroethene	10.0	10.5		ug/L		105	70 - 125
trans-1,2-Dichloroethene	10.0	11.0		ug/L		110	74 - 130
Trichloroethene	10.0	10.2		ug/L		102	71 - 121
Vinyl chloride	10.0	11.0		ug/L		110	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*103*		*78 - 129*

Lab Sample ID: 240-144838-B-2 MS
Matrix: Water
Analysis Batch: 475239

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*75 - 130*
4-Bromofluorobenzene (Surr)	*98*		*47 - 134*
Toluene-d8 (Surr)	*95*		*69 - 122*
Dibromofluoromethane (Surr)	*107*		*78 - 129*

Lab Sample ID: 240-144838-B-2 MSD
Matrix: Water
Analysis Batch: 475239

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*75 - 130*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144838-B-2 MSD
Matrix: Water
Analysis Batch: 475239

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*101*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475458/5
Matrix: Water
Analysis Batch: 475458

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/04/21 11:50	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*87*		*70 - 133*		*03/04/21 11:50*	*1*

Lab Sample ID: LCS 240-475458/4
Matrix: Water
Analysis Batch: 475458

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	8.91		ug/L		89	80 - 135		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*

Lab Sample ID: 240-145136-J-2 MS
Matrix: Water
Analysis Batch: 475458

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	4.1		10.0	13.2		ug/L		91	46 - 170		

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*85*		*70 - 133*

Lab Sample ID: 240-145136-J-2 MSD
Matrix: Water
Analysis Batch: 475458

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	4.1		10.0	14.1		ug/L		100	46 - 170	6	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145140-1

GC/MS VOA

Analysis Batch: 475239

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-145140-1	TRIP BLANK	Total/NA	Water	8260B	
240-145140-2	MW-216S_022521	Total/NA	Water	8260B	
MB 240-475239/7	Method Blank	Total/NA	Water	8260B	
LCS 240-475239/4	Lab Control Sample	Total/NA	Water	8260B	
240-144838-B-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144838-B-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 475458

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-145140-2	MW-216S_022521	Total/NA	Water	8260B SIM	
MB 240-475458/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-475458/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-145136-J-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-145136-J-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145140-1

Client Sample ID: TRIP BLANK
Date Collected: 02/25/21 00:00
Date Received: 02/27/21 08:00

Lab Sample ID: 240-145140-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475239	03/03/21 18:28	LEE	TAL CAN

Client Sample ID: MW-216S_022521
Date Collected: 02/25/21 15:42
Date Received: 02/27/21 08:00

Lab Sample ID: 240-145140-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475239	03/03/21 18:50	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	475458	03/04/21 15:35	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145140-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

MICHIGAN
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Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

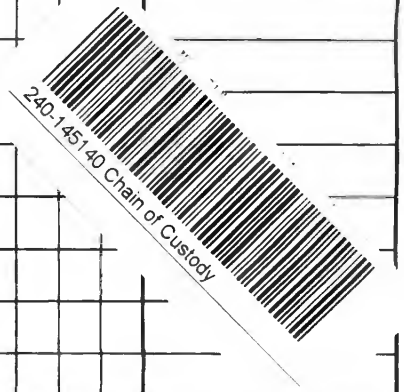
TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Kristoffer Hinskey	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day — 10 day		Walk-in client:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling:
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-216S_022521	2/25/21	1512		G						G					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM



Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company: Arcadis	Date/Time: 2/25/21 1710	Received by: Novi Cold Storage	Company: Arcadis	Date/Time: 2/25/21 1710
Relinquished by:	Company: Arcadis	Date/Time: 2/26/21	Received by:	Company: GTA	Date/Time: 2/26/21 0930
Relinquished by:	Company: GTA	Date/Time: 2/26/21 0930	Received in Laboratory by:	Company:	Date/Time:

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3/12/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 240-145140
Canton Facility

Client Arcadis Site Name

Cooler Received on FEB 27 2021 Opened on MAR 01 2021

Cooler unpacked by: MJS ETA CANTON

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam ~~Plastic Bag~~ None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.8 °C Corrected Cooler Temp. 1.9 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? (Yes) No
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # NA (Yes) No
17. Was a LL Hg or Me Hg trip blank present? Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by: MJS ETA CANTON

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT



March 13, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 145140-1
Sample date: 2021-02-25
Report received by CADENA: 2021-03-12
Initial Data Verification completed by CADENA: 2021-03-13
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

> The matrix spike/matrix spike duplicate (MS/MSD) analytes were not reported, because the analyte list for these samples did not match the analyte list for the MS/MSD parent sample.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 145140-1

		Sample Name:	TRIP BLANK				MW-216S_022521			
		Lab Sample ID:	2401451401				2401451402			
		Sample Date:	2/25/2021				2/25/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS Design & Consultancy for natural and built assets

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

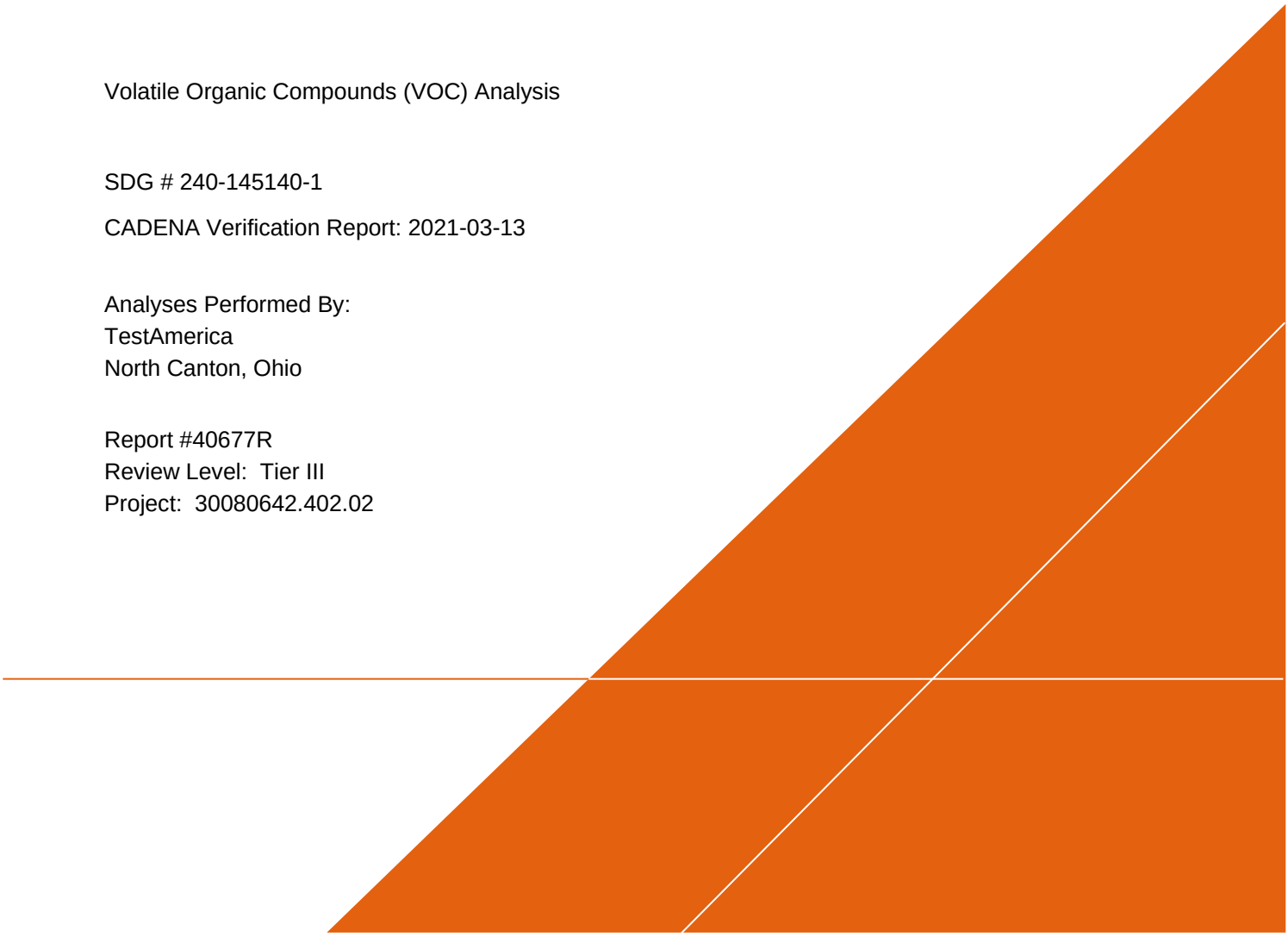
Volatile Organic Compounds (VOC) Analysis

SDG # 240-145140-1

CADENA Verification Report: 2021-03-13

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report #40677R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-145140-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					VOC
TRIP BLANK	240-145140-1	Water	02/25/2021		X
MW-216S_022521	240-145140-2	Water	02/25/2021		X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Prashanth K

SIGNATURE: 

DATE: March 26, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 29, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN
190

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

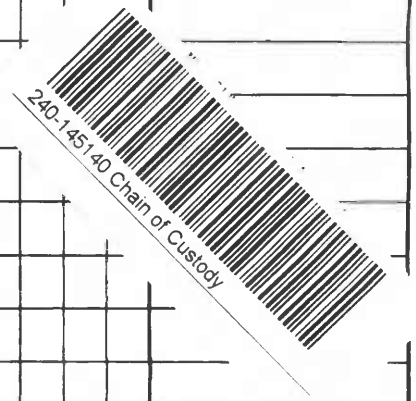
TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Kara Donahue	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling:
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-216S_022521	2/25/21	1542		G						G					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM



Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Kara Donahue	Arcadis	2/25/21 1710	Novi Cold Storage	Arcadis	2/25/21 1710
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Julia McClafferty	Arcadis	2/26/21 /		GTA	2/26/21 0930
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
	GTA	2/26/21 0930			

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03/12/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-145140-1
Date Collected: 02/25/21 00:00
Matrix: Water
Date Received: 02/27/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 18:28	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 18:28	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 18:28	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 18:28	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 18:28	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 18:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*75 - 130*		*03/03/21 18:28*	*1*
4-Bromofluorobenzene (Surr)	*75*		*47 - 134*		*03/03/21 18:28*	*1*
Toluene-d8 (Surr)	*86*		*69 - 122*		*03/03/21 18:28*	*1*
Dibromofluoromethane (Surr)	*118*		*78 - 129*		*03/03/21 18:28*	*1*

Client Sample ID: MW-216S_022521
Lab Sample ID: 240-145140-2
Date Collected: 02/25/21 15:42
Matrix: Water
Date Received: 02/27/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/04/21 15:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*70 - 133*		*03/04/21 15:35*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 18:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 18:50	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 18:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 18:50	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 18:50	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 18:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*75 - 130*		*03/03/21 18:50*	*1*
4-Bromofluorobenzene (Surr)	*76*		*47 - 134*		*03/03/21 18:50*	*1*
Toluene-d8 (Surr)	*85*		*69 - 122*		*03/03/21 18:50*	*1*
Dibromofluoromethane (Surr)	*120*		*78 - 129*		*03/03/21 18:50*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-145162-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/12/2021 4:52:26 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
Review your project results through TotalAccess
Have a Question? Ask The Expert
Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145162-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145162-1

Job ID: 240-145162-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-145162-1

Comments
No additional comments.

Receipt
The samples were received on 3/2/2021 9:15 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.1° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145162-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145162-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-145162-1	TRIP BLANK	Water	02/26/21 00:00	03/02/21 09:15	
240-145162-2	MW-116S_022621	Water	02/26/21 09:13	03/02/21 09:15	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145162-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-145162-1

No Detections.

Client Sample ID: MW-116S_022621 — Lab Sample ID: 240-145162-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145162-1

Client Sample ID: TRIP BLANK

Date Collected: 02/26/21 00:00
Date Received: 03/02/21 09:15

Lab Sample ID: 240-145162-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 18:41	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/04/21 18:41	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/04/21 18:41	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 18:41	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/04/21 18:41	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/04/21 18:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*111*		*75 - 130*		*03/04/21 18:41*	*1*
4-Bromofluorobenzene (Surr)	*56*		*47 - 134*		*03/04/21 18:41*	*1*
Toluene-d8 (Surr)	*71*		*69 - 122*		*03/04/21 18:41*	*1*
Dibromofluoromethane (Surr)	*111*		*78 - 129*		*03/04/21 18:41*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145162-1

Client Sample ID: MW-116S_022621
Date Collected: 02/26/21 09:13
Date Received: 03/02/21 09:15

Lab Sample ID: 240-145162-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/04/21 17:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 133*		*03/04/21 17:41*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 19:05	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/04/21 19:05	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/04/21 19:05	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 19:05	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/04/21 19:05	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/04/21 19:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*109*		*75 - 130*		*03/04/21 19:05*	*1*
4-Bromofluorobenzene (Surr)	*62*		*47 - 134*		*03/04/21 19:05*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*03/04/21 19:05*	*1*
Dibromofluoromethane (Surr)	*114*		*78 - 129*		*03/04/21 19:05*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145162-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-145162-1	TRIP BLANK	111	56	71	111
240-145162-2	MW-116S_022621	109	62	80	114
240-145164-M-2 MS	Matrix Spike	95	93	89	92
240-145164-N-2 MSD	Matrix Spike Duplicate	84	85	87	90
LCS 240-475466/4	Lab Control Sample	84	87	86	88
MB 240-475466/7	Method Blank	106	64	79	109

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-145136-J-2 MS	Matrix Spike	85
240-145136-J-2 MSD	Matrix Spike Duplicate	86
240-145162-2	MW-116S_022621	94
LCS 240-475458/4	Lab Control Sample	84
MB 240-475458/5	Method Blank	87

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475466/7
Matrix: Water
Analysis Batch: 475466

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 16:39	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/04/21 16:39	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/04/21 16:39	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 16:39	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/04/21 16:39	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/04/21 16:39	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*75 - 130*		*03/04/21 16:39*	*1*
4-Bromofluorobenzene (Surr)	*64*		*47 - 134*		*03/04/21 16:39*	*1*
Toluene-d8 (Surr)	*79*		*69 - 122*		*03/04/21 16:39*	*1*
Dibromofluoromethane (Surr)	*109*		*78 - 129*		*03/04/21 16:39*	*1*

Lab Sample ID: LCS 240-475466/4
Matrix: Water
Analysis Batch: 475466

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	11.0		ug/L		110	73 - 129
cis-1,2-Dichloroethene	10.0	9.51		ug/L		95	75 - 124
Tetrachloroethene	10.0	12.0		ug/L		120	70 - 125
trans-1,2-Dichloroethene	10.0	10.3		ug/L		103	74 - 130
Trichloroethene	10.0	9.56		ug/L		96	71 - 121
Vinyl chloride	10.0	10.8		ug/L		108	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*
Toluene-d8 (Surr)	*86*		*69 - 122*
Dibromofluoromethane (Surr)	*88*		*78 - 129*

Lab Sample ID: 240-145164-M-2 MS
Matrix: Water
Analysis Batch: 475466

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	11.0		ug/L		110	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	9.35		ug/L		93	68 - 121
Tetrachloroethene	1.0	U	10.0	12.4		ug/L		124	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	10.6		ug/L		106	69 - 126
Trichloroethene	1.0	U	10.0	9.05		ug/L		90	56 - 124
Vinyl chloride	1.0	U	10.0	10.9		ug/L		109	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*95*		*75 - 130*
4-Bromofluorobenzene (Surr)	*93*		*47 - 134*
Toluene-d8 (Surr)	*89*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-145164-M-2 MS
Matrix: Water
Analysis Batch: 475466

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*92*		*78 - 129*

Lab Sample ID: 240-145164-N-2 MSD
Matrix: Water
Analysis Batch: 475466

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.07		ug/L		91	64 - 132	19	35
cis-1,2-Dichloroethene	1.0	U	10.0	8.16		ug/L		82	68 - 121	14	35
Tetrachloroethene	1.0	U	10.0	10.4		ug/L		104	52 - 129	18	35
trans-1,2-Dichloroethene	1.0	U	10.0	8.75		ug/L		87	69 - 126	20	35
Trichloroethene	1.0	U	10.0	9.44		ug/L		94	56 - 124	4	35
Vinyl chloride	1.0	U	10.0	9.34		ug/L		93	49 - 136	15	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*
4-Bromofluorobenzene (Surr)	*85*		*47 - 134*
Toluene-d8 (Surr)	*87*		*69 - 122*
Dibromofluoromethane (Surr)	*90*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475458/5
Matrix: Water
Analysis Batch: 475458

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/04/21 11:50	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*70 - 133*		*03/04/21 11:50*	*1*

Lab Sample ID: LCS 240-475458/4
Matrix: Water
Analysis Batch: 475458

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	8.91		ug/L		89	80 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*

Lab Sample ID: 240-145136-J-2 MS
Matrix: Water
Analysis Batch: 475458

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	4.1		10.0	13.2		ug/L		91	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*85*		*70 - 133*

Lab Sample ID: 240-145136-J-2 MSD
Matrix: Water
Analysis Batch: 475458

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	4.1		10.0	14.1		ug/L		100	46 - 170	6	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145162-1

GC/MS VOA

Analysis Batch: 475458

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-145162-2	MW-116S_022621	Total/NA	Water	8260B SIM	
MB 240-475458/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-475458/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-145136-J-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-145136-J-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 475466

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-145162-1	TRIP BLANK	Total/NA	Water	8260B	
240-145162-2	MW-116S_022621	Total/NA	Water	8260B	
MB 240-475466/7	Method Blank	Total/NA	Water	8260B	
LCS 240-475466/4	Lab Control Sample	Total/NA	Water	8260B	
240-145164-M-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-145164-N-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145162-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-145162-1

Date Collected: 02/26/21 00:00

Matrix: Water

Date Received: 03/02/21 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475466	03/04/21 18:41	LRW	TAL CAN

Client Sample ID: MW-116S_022621

Lab Sample ID: 240-145162-2

Date Collected: 02/26/21 09:13

Matrix: Water

Date Received: 03/02/21 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475466	03/04/21 19:05	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	475458	03/04/21 17:41	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145162-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

MICHIGAN 190 — TestAmerica — THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Kristoffer Hinskey	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client:
Phone: 248-994-2240	Method of Shipment/Carrier:	10 day		Lab sampling:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-116S_022621	2/26/21	0913		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-145162 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	2/26/21 1730	Novi Cold Storage	Arcadis	2/26/21 1730
Rachel Bielak	Arcadis	3/1/21 1100	[signature]	ETA	3/1/21 11:01
[signature]	ETA	3/1/21 1253	Received in Laboratory by: [signature]	ETA	3-2-21 915

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative Login # : 240-145162
Canton Facility

Client Arcadis Site Name

Cooler unpacked by: Mathew

Cooler Received on 3-2-21 Opened on 3-2-21

FedEx: 1st (Grd) Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # 17 Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2.0 °C Corrected Cooler Temp. 2.1 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? (Yes) No
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)? (Y) (Y) (Y)
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# **HC022887**
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 021280IF (Yes) No
17. Was a LL Hg or Me Hg trip blank present? ____ Yes No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by: MJS ETA CANTON

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

WI-NC-099

DATA VERIFICATION REPORT

March 13, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 145162-1
Sample date: 2021-02-26
Report received by CADENA: 2021-03-12
Initial Data Verification completed by CADENA: 2021-03-13
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 145162-1

		Sample Name:	TRIP BLANK				MW-116S_022621			
		Lab Sample ID:	2401451621				2401451622			
		Sample Date:	2/26/2021				2/26/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS Design & Consultancy for natural and built assets

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

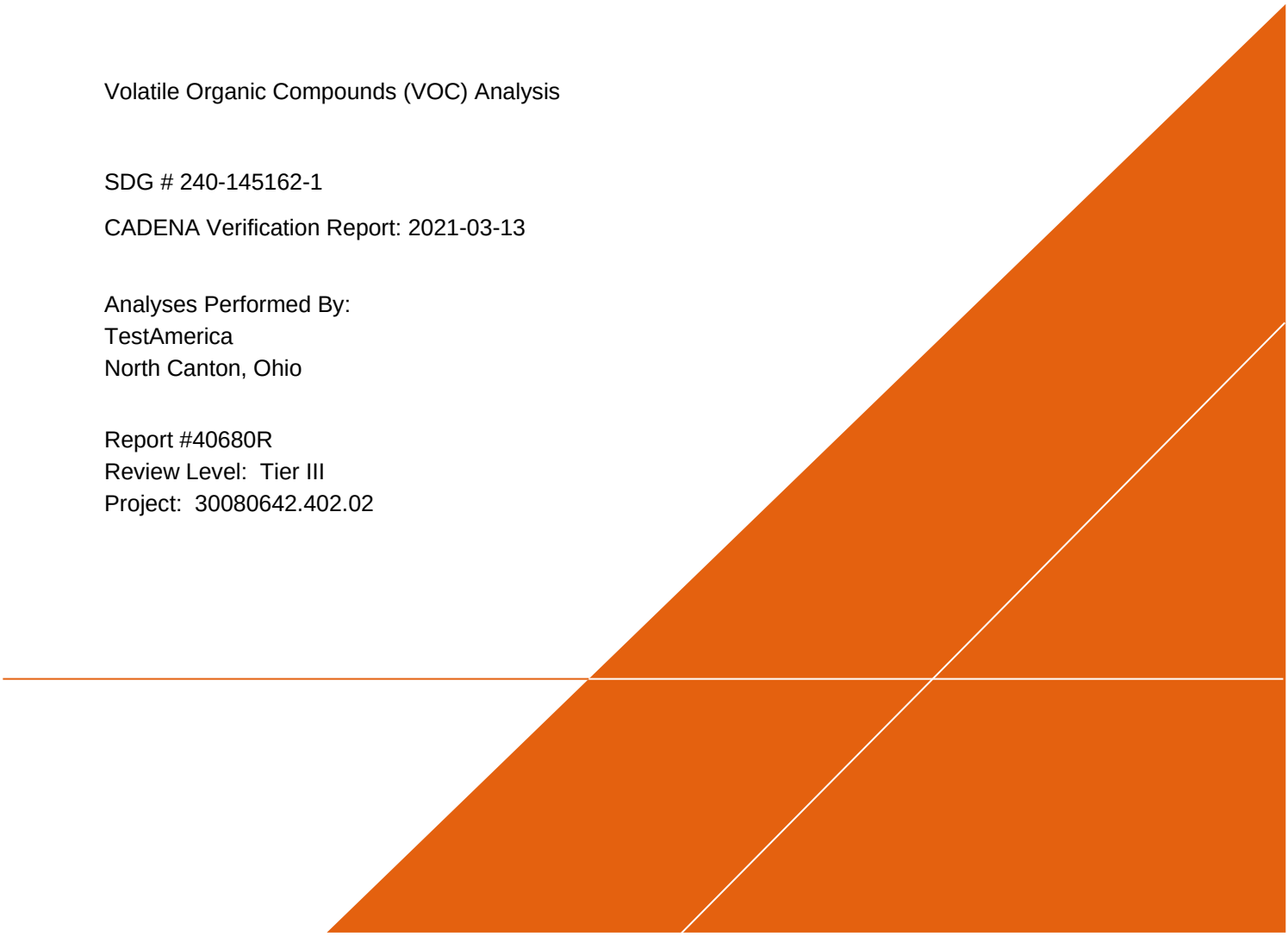
Volatile Organic Compounds (VOC) Analysis

SDG # 240-145162-1

CADENA Verification Report: 2021-03-13

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report #40680R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-145162-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					VOC
TRIP BLANK	240-145162-1	Water	02/26/2021		X
MW-116S_022621	240-145162-2	Water	02/26/2021		X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Prashanth K

SIGNATURE: 

DATE: March 26, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 29, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: [signature]	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling:
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-116S_022621	2/26/21	0913		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-145162 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	2/26/21 1730	Novi Cold Storage	Arcadis	2/26/21 1730
RACHEL BIELAK	ARCADIS	3/1/21 1100	[signature]	ETA	3/1/21 11.01
[signature]	ETA	3/1/21 1253	Received in Laboratory by: [signature]	ETA	3-2-21 915

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-145162-1
Date Collected: 02/26/21 00:00
Matrix: Water
Date Received: 03/02/21 09:15

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 18:41	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/04/21 18:41	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/04/21 18:41	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 18:41	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/04/21 18:41	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/04/21 18:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*111*		*75 - 130*		*03/04/21 18:41*	*1*
4-Bromofluorobenzene (Surr)	*56*		*47 - 134*		*03/04/21 18:41*	*1*
Toluene-d8 (Surr)	*71*		*69 - 122*		*03/04/21 18:41*	*1*
Dibromofluoromethane (Surr)	*111*		*78 - 129*		*03/04/21 18:41*	*1*

Client Sample ID: MW-116S_022621
Lab Sample ID: 240-145162-2
Date Collected: 02/26/21 09:13
Matrix: Water
Date Received: 03/02/21 09:15

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/04/21 17:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 133*		*03/04/21 17:41*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 19:05	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/04/21 19:05	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/04/21 19:05	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 19:05	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/04/21 19:05	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/04/21 19:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*109*		*75 - 130*		*03/04/21 19:05*	*1*
4-Bromofluorobenzene (Surr)	*62*		*47 - 134*		*03/04/21 19:05*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*03/04/21 19:05*	*1*
Dibromofluoromethane (Surr)	*114*		*78 - 129*		*03/04/21 19:05*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144910-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/11/2021 4:31:33 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
Review your project results through TotalAccess
Have a Question? Ask The Expert
Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144910-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144910-1

Job ID: 240-144910-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144910-1

Comments
No additional comments.

Receipt
The samples were received on 2/25/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.7º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144910-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144910-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144910-1	TRIP BLANK	Water	02/23/21 00:00	02/25/21 08:00	
240-144910-2	MW-179S_022321	Water	02/23/21 12:00	02/25/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144910-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144910-1

No Detections.

Client Sample ID: MW-179S_022321 — Lab Sample ID: 240-144910-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144910-1

Client Sample ID: TRIP BLANK

Date Collected: 02/23/21 00:00
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144910-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 15:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 15:24	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 15:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 15:24	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 15:24	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 15:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*75 - 130*		*03/02/21 15:24*	*1*
4-Bromofluorobenzene (Surr)	*80*		*47 - 134*		*03/02/21 15:24*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*03/02/21 15:24*	*1*
Dibromofluoromethane (Surr)	*95*		*78 - 129*		*03/02/21 15:24*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144910-1

Client Sample ID: MW-179S_022321
Date Collected: 02/23/21 12:00
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144910-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 16:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 133*		*03/02/21 16:35*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 15:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 15:46	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 15:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 15:46	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 15:46	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 15:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*75 - 130*		*03/02/21 15:46*	*1*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*		*03/02/21 15:46*	*1*
Toluene-d8 (Surr)	*97*		*69 - 122*		*03/02/21 15:46*	*1*
Dibromofluoromethane (Surr)	*96*		*78 - 129*		*03/02/21 15:46*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144910-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144718-C-13 MS	Matrix Spike	97	95	99	99
240-144718-C-13 MSD	Matrix Spike Duplicate	97	89	97	99
240-144910-1	TRIP BLANK	94	80	93	95
240-144910-2	MW-179S_022321	99	87	97	96
LCS 240-475001/4	Lab Control Sample	92	88	92	97
MB 240-475001/6	Method Blank	100	85	95	99

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144910-2	MW-179S_022321	94
240-145076-O-2 MS	Matrix Spike	94
240-145076-O-2 MSD	Matrix Spike Duplicate	91
LCS 240-475052/4	Lab Control Sample	88
MB 240-475052/5	Method Blank	87

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475001/6
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 11:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 11:19	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 11:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 11:19	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 11:19	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 11:19	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*03/02/21 11:19*	*1*
4-Bromofluorobenzene (Surr)	*85*		*47 - 134*		*03/02/21 11:19*	*1*
Toluene-d8 (Surr)	*95*		*69 - 122*		*03/02/21 11:19*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*03/02/21 11:19*	*1*

Lab Sample ID: LCS 240-475001/4
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.92		ug/L		89	73 - 129
cis-1,2-Dichloroethene	10.0	9.98		ug/L		100	75 - 124
Tetrachloroethene	10.0	9.61		ug/L		96	70 - 125
trans-1,2-Dichloroethene	10.0	9.73		ug/L		97	74 - 130
Trichloroethene	10.0	9.44		ug/L		94	71 - 121
Vinyl chloride	10.0	9.30		ug/L		93	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*
Toluene-d8 (Surr)	*92*		*69 - 122*
Dibromofluoromethane (Surr)	*97*		*78 - 129*

Lab Sample ID: 240-144718-C-13 MS
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25	U	250	217		ug/L		87	64 - 132
cis-1,2-Dichloroethene	25	U	250	230		ug/L		92	68 - 121
Tetrachloroethene	5.3	J	250	231		ug/L		90	52 - 129
trans-1,2-Dichloroethene	25	U	250	224		ug/L		90	69 - 126
Trichloroethene	510		250	655		ug/L		57	56 - 124
Vinyl chloride	25	U	250	208		ug/L		83	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*99*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144718-C-13 MS
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	*99*		*78 - 129*

Lab Sample ID: 240-144718-C-13 MSD
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	25	U	250	236		ug/L		94	64 - 132	8	35
cis-1,2-Dichloroethene	25	U	250	241		ug/L		97	68 - 121	5	35
Tetrachloroethene	5.3	J	250	251		ug/L		98	52 - 129	9	35
trans-1,2-Dichloroethene	25	U	250	236		ug/L		94	69 - 126	5	35
Trichloroethene	510		250	728		ug/L		86	56 - 124	11	35
Vinyl chloride	25	U	250	256		ug/L		103	49 - 136	21	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*
Toluene-d8 (Surr)	*97*		*69 - 122*
Dibromofluoromethane (Surr)	*99*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475052/5
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 12:26	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*87*		*70 - 133*		*03/02/21 12:26*	*1*

Lab Sample ID: LCS 240-475052/4
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.00		ug/L		90	80 - 135

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 133*

Lab Sample ID: 240-145076-O-2 MS
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	9.73		ug/L		97	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 133*

Lab Sample ID: 240-145076-O-2 MSD
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.82		ug/L		98	46 - 170	1	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*91*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144910-1

GC/MS VOA

Analysis Batch: 475001

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144910-1	TRIP BLANK	Total/NA	Water	8260B	
240-144910-2	MW-179S_022321	Total/NA	Water	8260B	
MB 240-475001/6	Method Blank	Total/NA	Water	8260B	
LCS 240-475001/4	Lab Control Sample	Total/NA	Water	8260B	
240-144718-C-13 MS	Matrix Spike	Total/NA	Water	8260B	
240-144718-C-13 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 475052

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144910-2	MW-179S_022321	Total/NA	Water	8260B SIM	
MB 240-475052/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-475052/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-145076-O-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-145076-O-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144910-1

Client Sample ID: TRIP BLANK
Date Collected: 02/23/21 00:00
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144910-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475001	03/02/21 15:24	LEE	TAL CAN

Client Sample ID: MW-179S_022321
Date Collected: 02/23/21 12:00
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144910-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475001	03/02/21 15:46	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	475052	03/02/21 16:35	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144910-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190

TestAmerica Laboratories, Inc.

Regulatory program: DW NPDES RCRA Other

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Allyson Hartt	TAT if different from below		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:	10 day ✓ 2 weeks; 3 weeks; 1 week; 2 days; 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 trip blank
MW-1795_022321	2/23/21	12:00		6						6					N	G	X	X	X	X	X	X	X	3 vials for 8260B 3 vials for 8260B SIM

240-144910 Chain of Custody

Possible Hazard Identification
✓ Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Return to Client ✓ Disposal By Lab Archive For Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Allyson Hartt	Arcadis	2/23/21 16:30	Novi cold storage	Arcadis	2/23/21 16:30
Julia McClafferty	Arcadis	2/24/21	Amanda Battershell	ETA	2/24/21 10:04
Amanda Battershell	ETA	2/24/21 1404	Received in Laboratory by:	Company: ETA	Date/Time: 2-25-21 805

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3/11/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 144910
Canton Facility

Client Arcadis Site Name

Cooler Received on 2-25-21 Opened on 2-25-21

Cooler unpacked by: Ryan C

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2.6 °C Corrected Cooler Temp. 2.7 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 58306 (Yes) No
17. Was a LL Hg or Me Hg trip blank present? ____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

WI-NC-099

DATA VERIFICATION REPORT

March 11, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144910-1
Sample date: 2021-02-23
Report received by CADENA: 2021-03-11
Initial Data Verification completed by CADENA: 2021-03-11
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144910-1

		Sample Name:	TRIP BLANK				MW-179S_022321			
		Lab Sample ID:	2401449101				2401449102			
		Sample Date:	2/23/2021				2/23/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

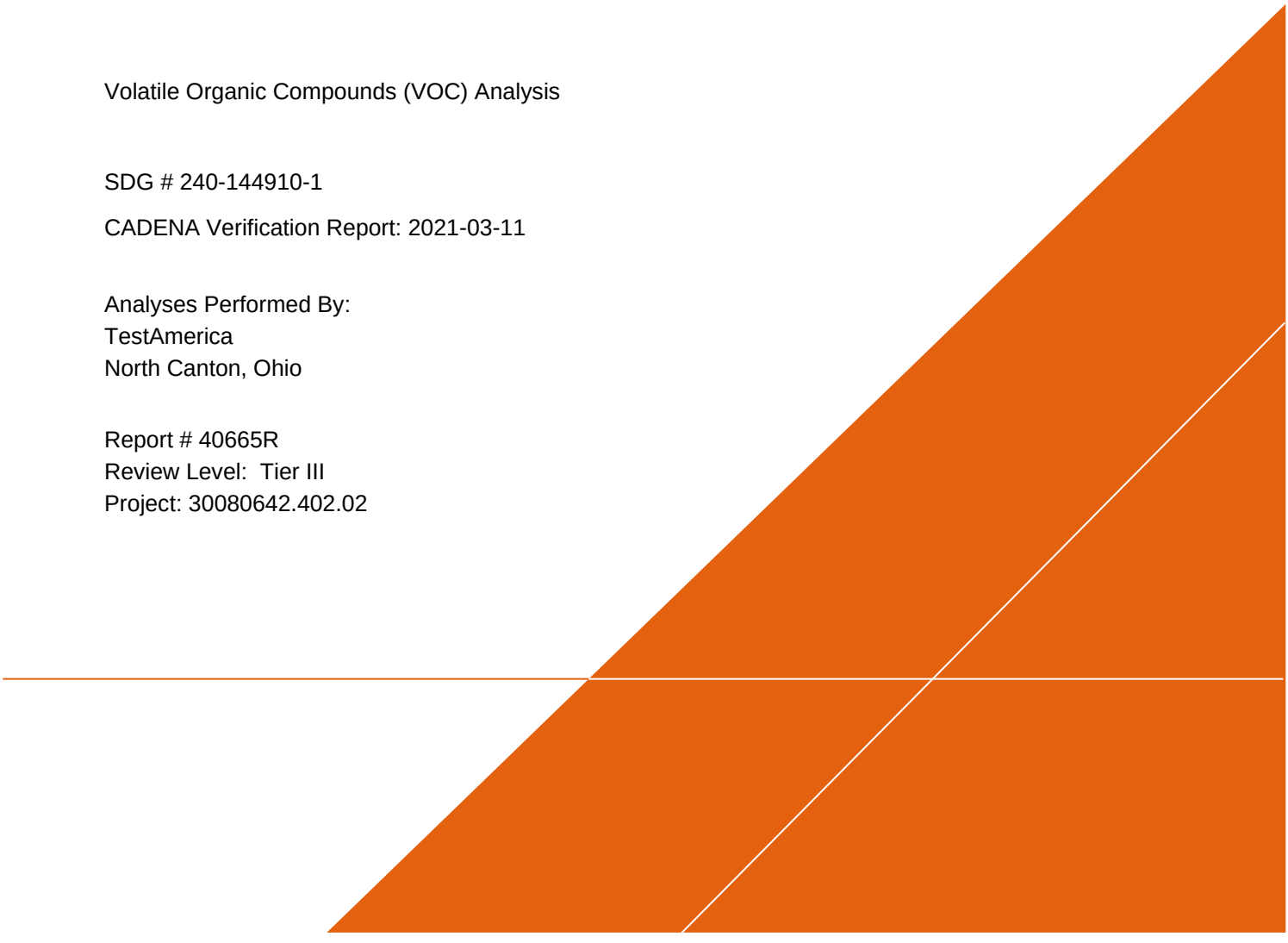
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144910-1

CADENA Verification Report: 2021-03-11

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40665R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144910-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144910-1	Water	02/23/2021		X	
MW-179S_022321	240-144910-2	Water	02/23/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

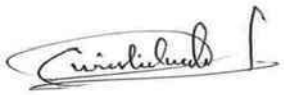
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 23, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 24, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

MICHIGAN 190

TestAmerica Laboratory location: Brighton – 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	DW NPDES RCRA Other				
Address: 28550 Cabot Drive, Suite 500		Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377		Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240		Sampler Name: Allyson Hartz	TAT if different from below: 10 day; 3 weeks, 2 weeks (✓), 1 week, 2 days, 1 day		Walk-in client
Project Name: Ford LTP Off-Site		Method of Shipment/Carrier:			Lab sampling
Project Number: 30050315.402.04		Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04					

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac / NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	x	x	x	x	x	x	x	Trip blank
MW-1795_022321	2/23/21	12:00		6						6					N	G	x	x	x	x	x	x	x	3 vials for 8260B 3 vials for 8260B SIM

240-144910 Chain of Custody

Possible Hazard Identification: Non-Hazard (✓) Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client Disposal By Lab (✓) Archive For Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by: Allyson Hartz	Arcadis	2/23/21 16:30	Navi cold storage	Arcadis	2/23/21 16:30
Relinquished by: Julia McClafferty	Arcadis	2/24/21	Brandon Battershell	ETA	2/24/21 10:04
Relinquished by: Brandon Battershell	ETA	2/24/21 1404	Received in Laboratory by:	Company: ETA	Date/Time: 2-25-21 800

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03/11/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144910-1

Date Collected: 02/23/21 00:00
Matrix: Water
Date Received: 02/25/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 15:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 15:24	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 15:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 15:24	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 15:24	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 15:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*75 - 130*		*03/02/21 15:24*	*1*
4-Bromofluorobenzene (Surr)	*80*		*47 - 134*		*03/02/21 15:24*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*03/02/21 15:24*	*1*
Dibromofluoromethane (Surr)	*95*		*78 - 129*		*03/02/21 15:24*	*1*

Client Sample ID: MW-179S_022321
Lab Sample ID: 240-144910-2

Date Collected: 02/23/21 12:00
Matrix: Water
Date Received: 02/25/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 16:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 133*		*03/02/21 16:35*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 15:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 15:46	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 15:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 15:46	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 15:46	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 15:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*75 - 130*		*03/02/21 15:46*	*1*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*		*03/02/21 15:46*	*1*
Toluene-d8 (Surr)	*97*		*69 - 122*		*03/02/21 15:46*	*1*
Dibromofluoromethane (Surr)	*96*		*78 - 129*		*03/02/21 15:46*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144909-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/11/2021 4:31:03 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144909-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144909-1

Job ID: 240-144909-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144909-1

Comments
No additional comments.

Receipt
The samples were received on 2/25/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.7º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144909-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144909-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144909-1	TRIP BLANK	Water	02/23/21 00:00	02/25/21 08:00	
240-144909-2	MW-180SR_022321	Water	02/23/21 13:07	02/25/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144909-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144909-1

No Detections.

Client Sample ID: MW-180SR_022321 — Lab Sample ID: 240-144909-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144909-1

Client Sample ID: TRIP BLANK
Date Collected: 02/23/21 00:00
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144909-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 14:39	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 14:39	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 14:39	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 14:39	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 14:39	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 14:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*75 - 130*		*03/02/21 14:39*	*1*
4-Bromofluorobenzene (Surr)	*83*		*47 - 134*		*03/02/21 14:39*	*1*
Toluene-d8 (Surr)	*94*		*69 - 122*		*03/02/21 14:39*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*03/02/21 14:39*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144909-1

Client Sample ID: MW-180SR_022321
Date Collected: 02/23/21 13:07
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144909-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 16:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 133*		*03/02/21 16:10*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 15:01	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 15:01	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 15:01	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 15:01	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 15:01	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 15:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*75 - 130*		*03/02/21 15:01*	*1*
4-Bromofluorobenzene (Surr)	*83*		*47 - 134*		*03/02/21 15:01*	*1*
Toluene-d8 (Surr)	*96*		*69 - 122*		*03/02/21 15:01*	*1*
Dibromofluoromethane (Surr)	*96*		*78 - 129*		*03/02/21 15:01*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144909-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144718-C-13 MS	Matrix Spike	97	95	99	99
240-144718-C-13 MSD	Matrix Spike Duplicate	97	89	97	99
240-144909-1	TRIP BLANK	96	83	94	98
240-144909-2	MW-180SR_022321	99	83	96	96
LCS 240-475001/4	Lab Control Sample	92	88	92	97
MB 240-475001/6	Method Blank	100	85	95	99

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144909-2	MW-180SR_022321	88
240-145076-O-2 MS	Matrix Spike	94
240-145076-O-2 MSD	Matrix Spike Duplicate	91
LCS 240-475052/4	Lab Control Sample	88
MB 240-475052/5	Method Blank	87

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475001/6
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 11:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 11:19	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 11:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 11:19	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 11:19	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 11:19	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*03/02/21 11:19*	*1*
4-Bromofluorobenzene (Surr)	*85*		*47 - 134*		*03/02/21 11:19*	*1*
Toluene-d8 (Surr)	*95*		*69 - 122*		*03/02/21 11:19*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*03/02/21 11:19*	*1*

Lab Sample ID: LCS 240-475001/4
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.92		ug/L		89	73 - 129
cis-1,2-Dichloroethene	10.0	9.98		ug/L		100	75 - 124
Tetrachloroethene	10.0	9.61		ug/L		96	70 - 125
trans-1,2-Dichloroethene	10.0	9.73		ug/L		97	74 - 130
Trichloroethene	10.0	9.44		ug/L		94	71 - 121
Vinyl chloride	10.0	9.30		ug/L		93	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*
Toluene-d8 (Surr)	*92*		*69 - 122*
Dibromofluoromethane (Surr)	*97*		*78 - 129*

Lab Sample ID: 240-144718-C-13 MS
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25	U	250	217		ug/L		87	64 - 132
cis-1,2-Dichloroethene	25	U	250	230		ug/L		92	68 - 121
Tetrachloroethene	5.3	J	250	231		ug/L		90	52 - 129
trans-1,2-Dichloroethene	25	U	250	224		ug/L		90	69 - 126
Trichloroethene	510		250	655		ug/L		57	56 - 124
Vinyl chloride	25	U	250	208		ug/L		83	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*99*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144718-C-13 MS
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	99		78 - 129

Lab Sample ID: 240-144718-C-13 MSD
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	25	U	250	236		ug/L		94	64 - 132	8	35
cis-1,2-Dichloroethene	25	U	250	241		ug/L		97	68 - 121	5	35
Tetrachloroethene	5.3	J	250	251		ug/L		98	52 - 129	9	35
trans-1,2-Dichloroethene	25	U	250	236		ug/L		94	69 - 126	5	35
Trichloroethene	510		250	728		ug/L		86	56 - 124	11	35
Vinyl chloride	25	U	250	256		ug/L		103	49 - 136	21	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	97		75 - 130
4-Bromofluorobenzene (Surr)	89		47 - 134
Toluene-d8 (Surr)	97		69 - 122
Dibromofluoromethane (Surr)	99		78 - 129

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475052/5
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 12:26	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	87		70 - 133		03/02/21 12:26	1

Lab Sample ID: LCS 240-475052/4
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.00		ug/L		90	80 - 135

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	88		70 - 133

Lab Sample ID: 240-145076-O-2 MS
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	9.73		ug/L		97	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 133*

Lab Sample ID: 240-145076-O-2 MSD
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.82		ug/L		98	46 - 170	1	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*91*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144909-1

GC/MS VOA

Analysis Batch: 475001

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144909-1	TRIP BLANK	Total/NA	Water	8260B	
240-144909-2	MW-180SR_022321	Total/NA	Water	8260B	
MB 240-475001/6	Method Blank	Total/NA	Water	8260B	
LCS 240-475001/4	Lab Control Sample	Total/NA	Water	8260B	
240-144718-C-13 MS	Matrix Spike	Total/NA	Water	8260B	
240-144718-C-13 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 475052

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144909-2	MW-180SR_022321	Total/NA	Water	8260B SIM	
MB 240-475052/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-475052/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-145076-O-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-145076-O-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144909-1

Client Sample ID: TRIP BLANK
Date Collected: 02/23/21 00:00
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144909-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475001	03/02/21 14:39	LEE	TAL CAN

Client Sample ID: MW-180SR_022321
Date Collected: 02/23/21 13:07
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144909-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475001	03/02/21 15:01	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	475052	03/02/21 16:10	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144909-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

TestAmerica MICHIGAN 190

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Allyson Hartz	TAT if different from below		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:	10 day ✓ 2 weeks / 3 weeks / 1 week / 2 days / 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	✓	X	✓	X	X	1 trip blank
MW-180SR_022321	2/23/21	13:07		6						6					N	G	X	X	X	X	✓	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-144909 Chain of Custody

Possible Hazard Identification
✓ Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Return to Client ✓ Disposal By Lab Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Allyson Hartz	Arcadis	2/23/21 16:30	Novi cold storage	Arcadis	2/23/21 16:30
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	2/24/2021	Amanda Battershell	ETA	2/24/21 1004
Relinquished by: Amanda Battershell	Company: ETA	Date/Time: 2/24/21 1404	Received in Laboratory by:	Company: TA	Date/Time: 2-25-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 141909
Canton Facility

Client Arcadis Site Name

Cooler unpacked by: Ryan C

Cooler Received on 2-25-21 Opened on 2-25-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2.6 °C Corrected Cooler Temp. 2.7 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 58306 (Yes) No
17. Was a LL Hg or Me Hg trip blank present? ____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

WI-NC-099

DATA VERIFICATION REPORT

March 11, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144909-1
Sample date: 2021-02-23
Report received by CADENA: 2021-03-11
Initial Data Verification completed by CADENA: 2021-03-11
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144909-1

		Sample Name:	TRIP BLANK				MW-180SR_022321			
		Lab Sample ID:	2401449091				2401449092			
		Sample Date:	2/23/2021				2/23/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

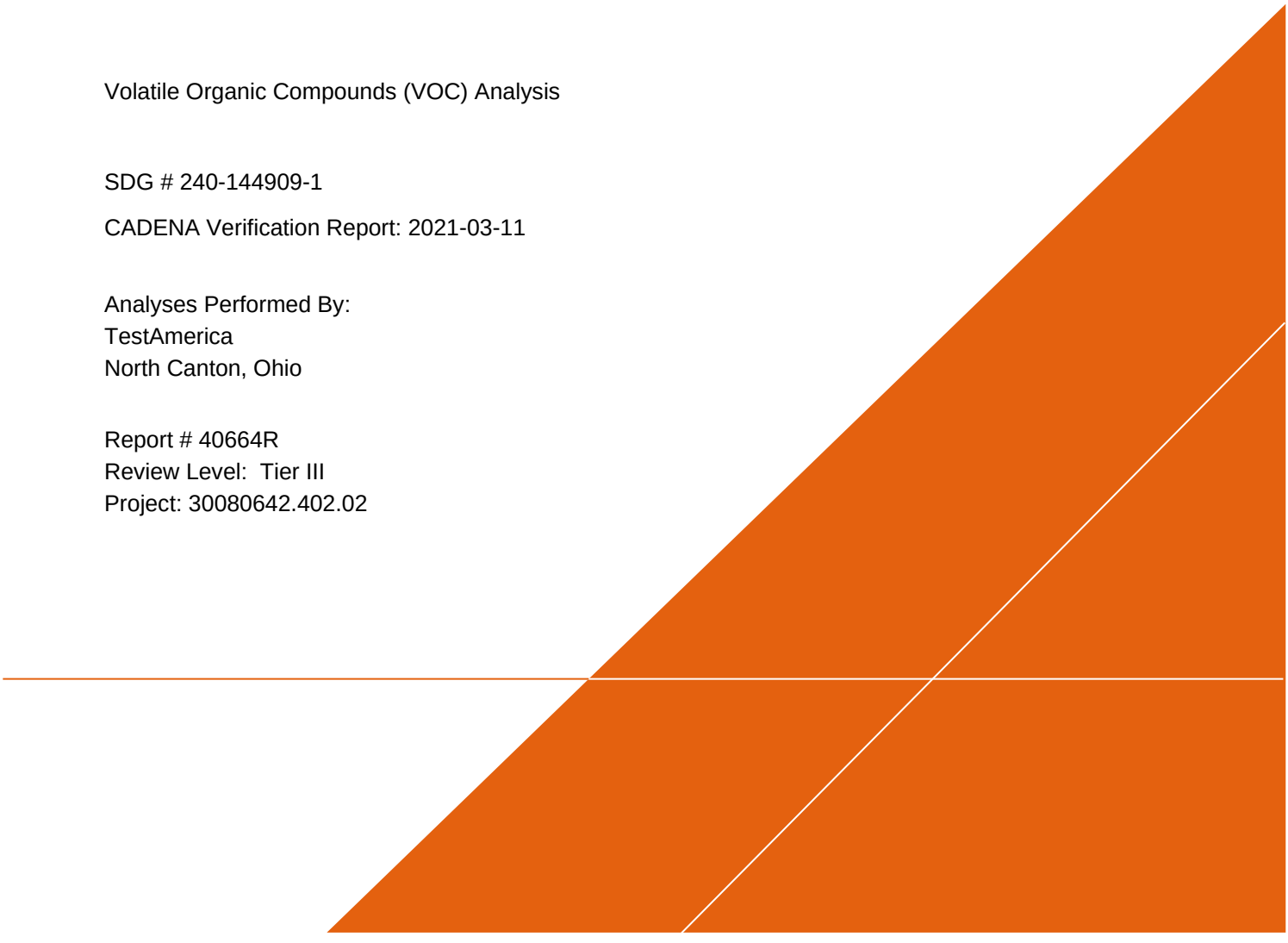
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144909-1

CADENA Verification Report: 2021-03-11

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40664R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144909-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144909-1	Water	02/23/2021		X	
MW-180SR_022321	240-144909-2	Water	02/23/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

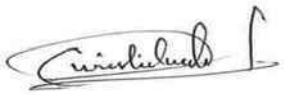
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 23, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 24, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica MICHIGAN 190

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Allyson Hartz	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client; Lab sampling; Job/SDG No:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			
Project Number: 30050315.402.04	Shipping/Tracking No:			
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	✓	X	✓	X	✓	1 trip blank
MW-190SR_022321	2/23/21	13:07		6						6					N	G	X	X	X	X	✓	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-144909 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalla@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Allyson Hartz	Arcadis	2/23/21 16:30	Novi cold storage	Arcadis	2/23/21 16:30
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	2/24/2021	Amanda Battershell	ETA	2/24/21 1004
Relinquished by: Amanda Battershell	Company: ETA	Date/Time: 2/24/21 1404	Received in Laboratory by:	Company: TA	Date/Time: 2-25-21 800

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03/11/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144909-1
Date Collected: 02/23/21 00:00
Matrix: Water
Date Received: 02/25/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 14:39	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 14:39	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 14:39	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 14:39	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 14:39	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 14:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*75 - 130*		*03/02/21 14:39*	*1*
4-Bromofluorobenzene (Surr)	*83*		*47 - 134*		*03/02/21 14:39*	*1*
Toluene-d8 (Surr)	*94*		*69 - 122*		*03/02/21 14:39*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*03/02/21 14:39*	*1*

Client Sample ID: MW-180SR_022321
Lab Sample ID: 240-144909-2
Date Collected: 02/23/21 13:07
Matrix: Water
Date Received: 02/25/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 16:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 133*		*03/02/21 16:10*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 15:01	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 15:01	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 15:01	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 15:01	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 15:01	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 15:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*75 - 130*		*03/02/21 15:01*	*1*
4-Bromofluorobenzene (Surr)	*83*		*47 - 134*		*03/02/21 15:01*	*1*
Toluene-d8 (Surr)	*96*		*69 - 122*		*03/02/21 15:01*	*1*
Dibromofluoromethane (Surr)	*96*		*78 - 129*		*03/02/21 15:01*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144917-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/11/2021 4:42:48 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144917-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144917-1

Job ID: 240-144917-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144917-1

Comments
No additional comments.

Receipt
The samples were received on 2/25/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.7º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144917-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144917-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144917-1	TRIP BLANK	Water	02/23/21 00:00	02/25/21 08:00	
240-144917-2	MW-104S_022321	Water	02/23/21 16:30	02/25/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144917-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144917-1

No Detections.

Client Sample ID: MW-104S_022321 — Lab Sample ID: 240-144917-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144917-1

Client Sample ID: TRIP BLANK
Date Collected: 02/23/21 00:00
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144917-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 15:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 15:07	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 15:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 15:07	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 15:07	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 15:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*75 - 130*		*03/02/21 15:07*	*1*
4-Bromofluorobenzene (Surr)	*75*		*47 - 134*		*03/02/21 15:07*	*1*
Toluene-d8 (Surr)	*79*		*69 - 122*		*03/02/21 15:07*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*03/02/21 15:07*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144917-1

Client Sample ID: MW-104S_022321
Date Collected: 02/23/21 16:30
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144917-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 18:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*70 - 133*		*03/02/21 18:40*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 16:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 16:19	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 16:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 16:19	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 16:19	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 16:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*115*		*75 - 130*		*03/02/21 16:19*	*1*
4-Bromofluorobenzene (Surr)	*67*		*47 - 134*		*03/02/21 16:19*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*03/02/21 16:19*	*1*
Dibromofluoromethane (Surr)	*113*		*78 - 129*		*03/02/21 16:19*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144917-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144917-1	TRIP BLANK	96	75	79	99
240-144917-2	MW-104S_022321	115	67	80	113
240-144917-2 MS	MW-104S_022321	89	90	90	91
240-144917-2 MSD	MW-104S_022321	88	90	102	89
LCS 240-475070/4	Lab Control Sample	91	92	91	94
MB 240-475070/7	Method Blank	107	77	81	108

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144917-2	MW-104S_022321	91
240-145076-O-2 MS	Matrix Spike	94
240-145076-O-2 MSD	Matrix Spike Duplicate	91
LCS 240-475052/4	Lab Control Sample	88
MB 240-475052/5	Method Blank	87

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475070/7
Matrix: Water
Analysis Batch: 475070

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 14:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 14:44	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 14:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 14:44	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 14:44	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 14:44	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*107*		*75 - 130*		*03/02/21 14:44*	*1*
4-Bromofluorobenzene (Surr)	*77*		*47 - 134*		*03/02/21 14:44*	*1*
Toluene-d8 (Surr)	*81*		*69 - 122*		*03/02/21 14:44*	*1*
Dibromofluoromethane (Surr)	*108*		*78 - 129*		*03/02/21 14:44*	*1*

Lab Sample ID: LCS 240-475070/4
Matrix: Water
Analysis Batch: 475070

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	11.0		ug/L		110	73 - 129
cis-1,2-Dichloroethene	10.0	9.24		ug/L		92	75 - 124
Tetrachloroethene	10.0	11.3		ug/L		113	70 - 125
trans-1,2-Dichloroethene	10.0	11.8		ug/L		118	74 - 130
Trichloroethene	10.0	9.62		ug/L		96	71 - 121
Vinyl chloride	10.0	10.8		ug/L		108	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*91*		*75 - 130*
4-Bromofluorobenzene (Surr)	*92*		*47 - 134*
Toluene-d8 (Surr)	*91*		*69 - 122*
Dibromofluoromethane (Surr)	*94*		*78 - 129*

Lab Sample ID: 240-144917-2 MS
Matrix: Water
Analysis Batch: 475070

Client Sample ID: MW-104S_022321
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	11.2		ug/L		112	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	9.43		ug/L		94	68 - 121
Tetrachloroethene	1.0	U	10.0	12.3		ug/L		123	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	11.8		ug/L		118	69 - 126
Trichloroethene	1.0	U	10.0	9.86		ug/L		99	56 - 124
Vinyl chloride	1.0	U	10.0	10.7		ug/L		107	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*75 - 130*
4-Bromofluorobenzene (Surr)	*90*		*47 - 134*
Toluene-d8 (Surr)	*90*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144917-2 MS
Matrix: Water
Analysis Batch: 475070

Client Sample ID: MW-104S_022321
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*91*		*78 - 129*

Lab Sample ID: 240-144917-2 MSD
Matrix: Water
Analysis Batch: 475070

Client Sample ID: MW-104S_022321
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	10.7		ug/L		107	64 - 132	4	35
cis-1,2-Dichloroethene	1.0	U	10.0	9.39		ug/L		94	68 - 121	0	35
Tetrachloroethene	1.0	U	10.0	11.7		ug/L		117	52 - 129	5	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.70		ug/L		97	69 - 126	19	35
Trichloroethene	1.0	U	10.0	10.7		ug/L		107	56 - 124	8	35
Vinyl chloride	1.0	U	10.0	11.2		ug/L		112	49 - 136	4	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 130*
4-Bromofluorobenzene (Surr)	*90*		*47 - 134*
Toluene-d8 (Surr)	*102*		*69 - 122*
Dibromofluoromethane (Surr)	*89*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475052/5
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 12:26	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*70 - 133*		*03/02/21 12:26*	*1*

Lab Sample ID: LCS 240-475052/4
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.00		ug/L		90	80 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 133*

Lab Sample ID: 240-145076-O-2 MS
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	9.73		ug/L		97	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 133*

Lab Sample ID: 240-145076-O-2 MSD
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.82		ug/L		98	46 - 170	1	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*91*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144917-1

GC/MS VOA

Analysis Batch: 475052

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144917-2	MW-104S_022321	Total/NA	Water	8260B SIM	
MB 240-475052/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-475052/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-145076-O-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-145076-O-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 475070

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144917-1	TRIP BLANK	Total/NA	Water	8260B	
240-144917-2	MW-104S_022321	Total/NA	Water	8260B	
MB 240-475070/7	Method Blank	Total/NA	Water	8260B	
LCS 240-475070/4	Lab Control Sample	Total/NA	Water	8260B	
240-144917-2 MS	MW-104S_022321	Total/NA	Water	8260B	
240-144917-2 MSD	MW-104S_022321	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144917-1

Client Sample ID: TRIP BLANK
Date Collected: 02/23/21 00:00
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144917-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475070	03/02/21 15:07	LRW	TAL CAN

Client Sample ID: MW-104S_022321
Date Collected: 02/23/21 16:30
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144917-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475070	03/02/21 16:19	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	475052	03/02/21 18:40	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144917-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

MICHIG TestAmerica 190

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ace/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-104S_022321	2/23/21	1630		6						6					N	G	X	X	X	X	X	X	X	3 vocs for 8260B; 3 vocs for 8260B SIM

240-144917 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Emma Witherspoon	Arcadis	2/23/21 1800	Novi cold Storage	Arcadis	2/23/21 1800
Julia McClafferty	Arcadis	2/24/2021	Amanda Battenfield	ETA	2/24/21 1004
Amanda Battenfield	ETA	2/24/21 1401	Received in Laboratory by:	Company: TA	Date/Time: 2-25-21 800

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3/11/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 144917
Canton Facility

Client Arcadis Site Name

Cooler Received on 2-25-21 Opened on 2-25-21

Cooler unpacked by: Ryan C

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2.6 °C Corrected Cooler Temp. 2.7 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes) No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes) No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes (No)
-Were tamper/custody seals intact and uncompromised?	(Yes) No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes (No)
4. Did custody papers accompany the sample(s)?	(Yes) No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes) No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?	(Y) N (Y)
10. Were correct bottle(s) used for the test(s) indicated?	(Yes) No
11. Sufficient quantity received to perform indicated analyses?	(Yes) No
12. Are these work share samples and all listed on the COC?	Yes (No)
If yes, Questions 13-17 have been checked at the originating laboratory.	
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No (NA) pH Strip Lot# HC997861
14. Were VOAs on the COC?	(Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 58306	(Yes) No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

WI-NC-099

DATA VERIFICATION REPORT

March 11, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144917-1
Sample date: 2021-02-23
Report received by CADENA: 2021-03-11
Initial Data Verification completed by CADENA: 2021-03-11
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, MS/MSD Recovery, MS/MSD RPD, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144917-1

		Sample Name:	TRIP BLANK				MW-104S_022321			
		Lab Sample ID:	2401449171				2401449172			
		Sample Date:	2/23/2021				2/23/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

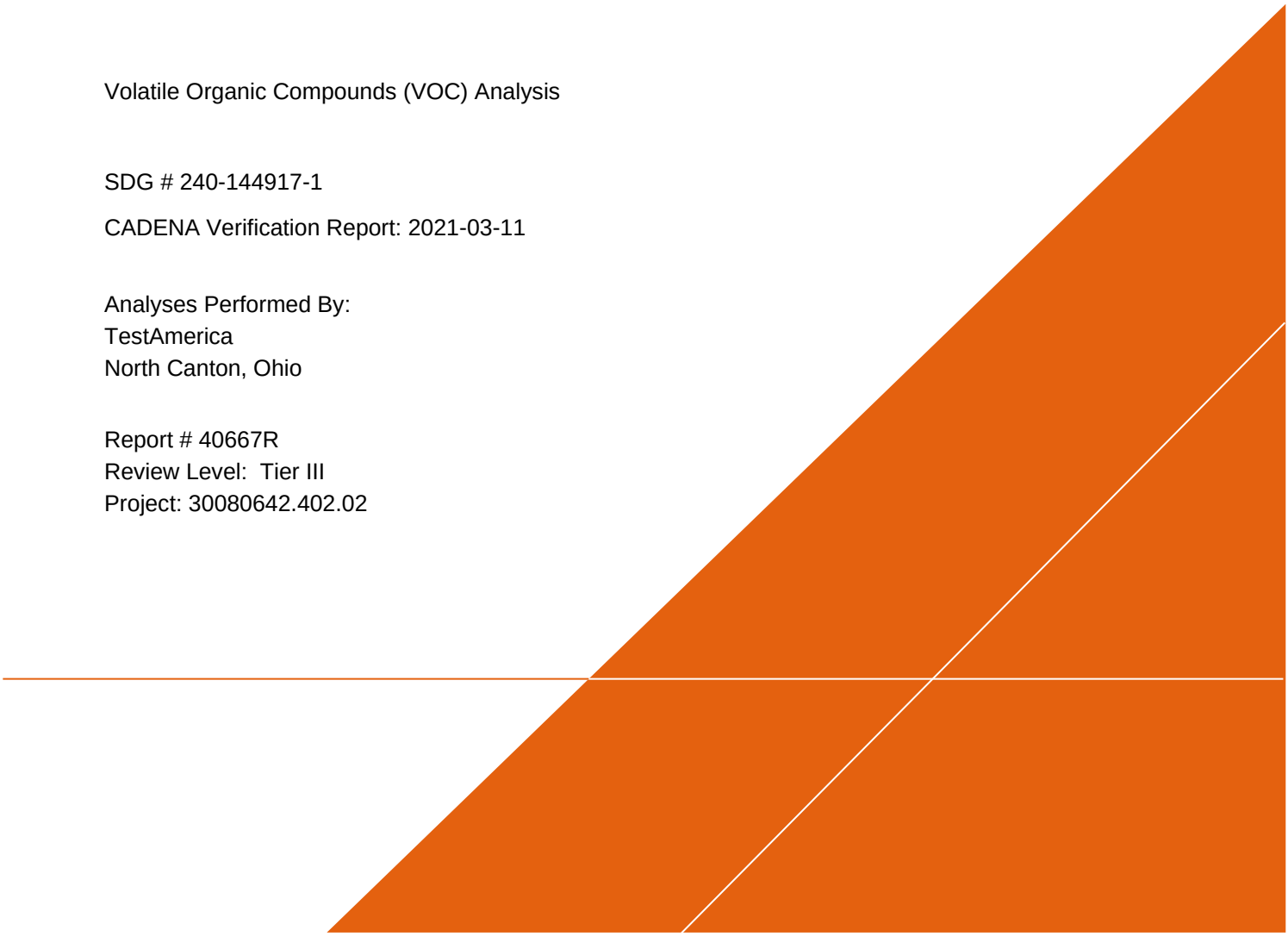
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144917-1

CADENA Verification Report: 2021-03-11

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40667R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144917-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144917-1	Water	02/23/2021		X	
MW-104S_022321	240-144917-2	Water	02/23/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

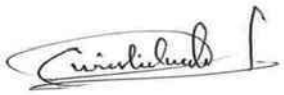
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 23, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 24, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190 — TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client; Lab sampling
Phone: 248-994-2240	Method of Shipment/Carrier:			Job/SDG No:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-104S_022321	2/23/21	1630		6						6					N	G	X	X	X	X	X	X	X	3 vocs for 8260B; 3 vocs for 8260B SIM

240-144917 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Witherspoon	Arcadis	2/23/21 1800	Novi cold Storage	Arcadis	2/23/21 1800
Julia McClafferty	Arcadis	2/24/2021	Amanda Battershell	ETA	2/24/21 1004
Amanda Battershell	ETA	2/24/21 1401	Received in Laboratory by:	Company: TA	Date/Time: 2-25-21 800

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144917-1

Date Collected: 02/23/21 00:00
Matrix: Water
Date Received: 02/25/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 15:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 15:07	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 15:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 15:07	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 15:07	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 15:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*75 - 130*		*03/02/21 15:07*	*1*
4-Bromofluorobenzene (Surr)	*75*		*47 - 134*		*03/02/21 15:07*	*1*
Toluene-d8 (Surr)	*79*		*69 - 122*		*03/02/21 15:07*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*03/02/21 15:07*	*1*

Client Sample ID: MW-104S_022321
Lab Sample ID: 240-144917-2

Date Collected: 02/23/21 16:30
Matrix: Water
Date Received: 02/25/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 18:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*70 - 133*		*03/02/21 18:40*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 16:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 16:19	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 16:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 16:19	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 16:19	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 16:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*115*		*75 - 130*		*03/02/21 16:19*	*1*
4-Bromofluorobenzene (Surr)	*67*		*47 - 134*		*03/02/21 16:19*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*03/02/21 16:19*	*1*
Dibromofluoromethane (Surr)	*113*		*78 - 129*		*03/02/21 16:19*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144660-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/5/2021 2:19:04 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144660-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144660-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144660-1

Comments
No additional comments.

Receipt
The samples were received on 2/19/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.5° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144660-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144660-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144660-1	TRIP BLANK	Water	02/17/21 00:00	02/19/21 08:00	
240-144660-2	MW-159S_021721	Water	02/17/21 15:31	02/19/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144660-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144660-1

No Detections.

Client Sample ID: MW-159S_021721 — Lab Sample ID: 240-144660-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144660-1

Client Sample ID: TRIP BLANK

Date Collected: 02/17/21 00:00
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144660-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 20:41	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 20:41	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 20:41	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 20:41	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 20:41	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 20:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*		*02/25/21 20:41*	*1*
4-Bromofluorobenzene (Surr)	*98*		*47 - 134*		*02/25/21 20:41*	*1*
Toluene-d8 (Surr)	*95*		*69 - 122*		*02/25/21 20:41*	*1*
Dibromofluoromethane (Surr)	*87*		*78 - 129*		*02/25/21 20:41*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144660-1

Client Sample ID: MW-159S_021721
Date Collected: 02/17/21 15:31
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144660-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 16:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/25/21 16:05*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 21:32	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 21:32	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 21:32	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 21:32	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 21:32	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 21:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*75 - 130*		*02/25/21 21:32*	*1*
4-Bromofluorobenzene (Surr)	*97*		*47 - 134*		*02/25/21 21:32*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*02/25/21 21:32*	*1*
Dibromofluoromethane (Surr)	*85*		*78 - 129*		*02/25/21 21:32*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144660-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144660-1	TRIP BLANK	86	98	95	87
240-144660-2	MW-159S_021721	85	97	93	85
240-144661-D-2 MS	Matrix Spike	84	99	93	86
240-144661-E-2 MSD	Matrix Spike Duplicate	84	99	94	87
LCS 240-474500/4	Lab Control Sample	85	101	93	86
MB 240-474500/7	Method Blank	86	98	94	86

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144568-J-3 MS	Matrix Spike	79
240-144568-J-3 MSD	Matrix Spike Duplicate	83
240-144660-2	MW-159S_021721	81
LCS 240-474490/4	Lab Control Sample	79
MB 240-474490/5	Method Blank	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474500/7
Matrix: Water
Analysis Batch: 474500

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 14:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 14:52	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 14:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 14:52	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 14:52	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 14:52	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*		*02/25/21 14:52*	*1*
4-Bromofluorobenzene (Surr)	*98*		*47 - 134*		*02/25/21 14:52*	*1*
Toluene-d8 (Surr)	*94*		*69 - 122*		*02/25/21 14:52*	*1*
Dibromofluoromethane (Surr)	*86*		*78 - 129*		*02/25/21 14:52*	*1*

Lab Sample ID: LCS 240-474500/4
Matrix: Water
Analysis Batch: 474500

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.93		ug/L		89	73 - 129
cis-1,2-Dichloroethene	10.0	9.08		ug/L		91	75 - 124
Tetrachloroethene	10.0	9.68		ug/L		97	70 - 125
trans-1,2-Dichloroethene	10.0	9.29		ug/L		93	74 - 130
Trichloroethene	10.0	8.87		ug/L		89	71 - 121
Vinyl chloride	10.0	10.7		ug/L		107	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*75 - 130*
4-Bromofluorobenzene (Surr)	*101*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*86*		*78 - 129*

Lab Sample ID: 240-144661-D-2 MS
Matrix: Water
Analysis Batch: 474500

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,2-Dichloroethene	1.0	U	10.0	8.81		ug/L		88	68 - 121
Tetrachloroethene	1.0	U	10.0	8.35		ug/L		84	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	8.36		ug/L		84	69 - 126
Trichloroethene	1.0	U	10.0	8.22		ug/L		82	56 - 124
Vinyl chloride	20		10.0	30.2		ug/L		102	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*
4-Bromofluorobenzene (Surr)	*99*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*86*		*78 - 129*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144661-E-2 MSD
Matrix: Water
Analysis Batch: 474500

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
cis-1,2-Dichloroethene	1.0	U	10.0	8.80		ug/L		88	68 - 121	0	35
Tetrachloroethene	1.0	U	10.0	8.53		ug/L		85	52 - 129	2	35
trans-1,2-Dichloroethene	1.0	U	10.0	8.64		ug/L		86	69 - 126	3	35
Trichloroethene	1.0	U	10.0	8.36		ug/L		84	56 - 124	2	35
Vinyl chloride	20		10.0	29.8		ug/L		98	49 - 136	1	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*
4-Bromofluorobenzene (Surr)	*99*		*47 - 134*
Toluene-d8 (Surr)	*94*		*69 - 122*
Dibromofluoromethane (Surr)	*87*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474490/5
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 12:43	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/25/21 12:43*	*1*

Lab Sample ID: LCS 240-474490/4
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.7		ug/L		107	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*

Lab Sample ID: 240-144568-J-3 MS
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	10.2		ug/L		102	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144568-J-3 MSD
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.2		ug/L		102	46 - 170	0	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*

GC/MS VOA

Analysis Batch: 474490

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144660-2	MW-159S_021721	Total/NA	Water	8260B SIM	
MB 240-474490/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474490/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144568-J-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144568-J-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474500

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144660-1	TRIP BLANK	Total/NA	Water	8260B	
240-144660-2	MW-159S_021721	Total/NA	Water	8260B	
MB 240-474500/7	Method Blank	Total/NA	Water	8260B	
LCS 240-474500/4	Lab Control Sample	Total/NA	Water	8260B	
240-144661-D-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144661-E-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144660-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144660-1

Date Collected: 02/17/21 00:00
Matrix: Water
Date Received: 02/19/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474500	02/25/21 20:41	LRW	TAL CAN

Client Sample ID: MW-159S_021721

Lab Sample ID: 240-144660-2

Date Collected: 02/17/21 15:31
Matrix: Water
Date Received: 02/19/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474500	02/25/21 21:32	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474490	02/25/21 16:05	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144660-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Gary Schafer	TAT if different from below: 10 day; ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/17/21			X						3							X	X	X	X	X	X	X	
MW-1595-021721	02/17/21	15:31		X						6					N	G	X	X	X	X	X	X	X	Method 8260B - 3 vials; 8260B SIM - 3 vials

240-144660 Chain of Custody

Page 17 of 18

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown	☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	02/17/21 1717	AVI cold storage	Arcadis	02/17/21 1717
Julia McClafferty	Arcadis	2/18/2021	Amanda Battenfield	ETA	2/18/21 10:18
Amanda Battenfield	ETA	2/18/21 11:30	Received in Laboratory by:	TA	2/19/21 800

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3/5/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 144620

Client Arcadis Site Name

Cooler Received on 2-19-21 Opened on 2-19-21

Cooler unpacked by:

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.4 °C Corrected Cooler Temp. 1.5 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC907861
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #	Yes	No
17. Was a LL Hg or Me Hg trip blank present?	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container.
Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.
Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

DATA VERIFICATION REPORT

March 05, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144660-1
Sample date: 2021-02-17
Report received by CADENA: 2021-03-05
Initial Data Verification completed by CADENA: 2021-03-05
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144660-1

		Sample Name:	TRIP BLANK				MW-159S_021721			
		Lab Sample ID:	2401446601				2401446602			
		Sample Date:	2/17/2021				2/17/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

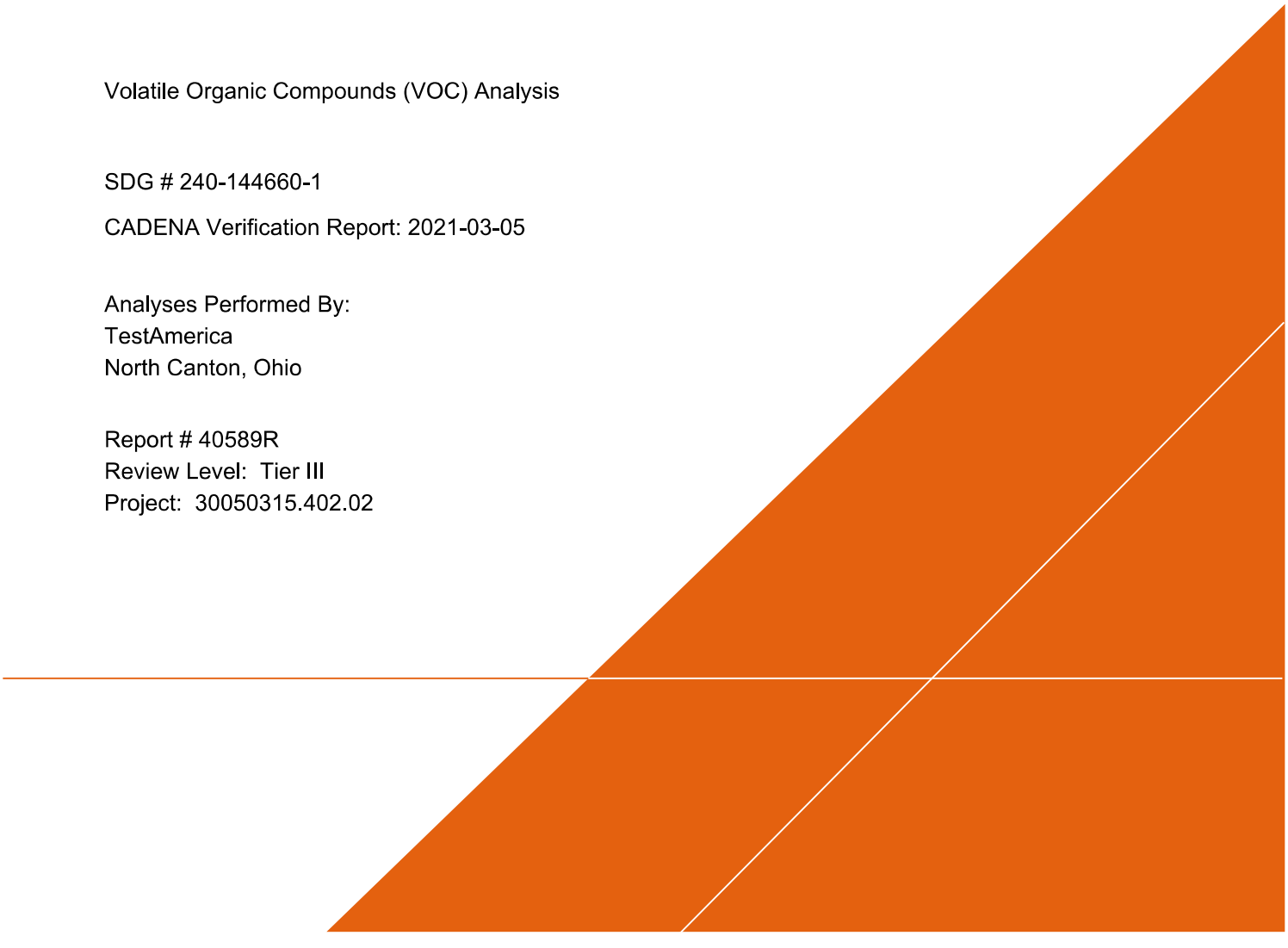
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144660-1

CADENA Verification Report: 2021-03-05

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40589R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144660-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144660-1	Water	02/17/2021		X	
MW-159S_021721	240-144660-2	Water	02/17/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 17, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 18, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

~~MICHIGAN~~ 190

TestAmerica Laboratories, Inc.

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	For lab use only
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		Walk-in client
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30050315.402.04	Shipping/Tracking No:			
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/17/21	—		X						1							X	X	X	X	X	X	X	
MW-1595-021721	02/17/21	15:31		X						10					N	G	X	X	X	X	X	X	X	Method 8260B - 3 vials; 8260B SIM - 3 vials

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240-144660 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com, Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: Gary Schafer	Arcadis	02/17/21	1717	Received by: FAVI cold storage	Arcadis 02/17/21 1717
Relinquished by: Julia McClafferty	Arcadis	2/18/2021		Received by: Amanda Battenfield	ETA 2/18/21 10:18
Relinquished by: Amanda Battenfield	ETA	2/18/21	11:55	Received in Laboratory by:	TA 2/19/21 800

03/03/2021

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144660-1
Date Collected: 02/17/21 00:00
Matrix: Water
Date Received: 02/19/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 20:41	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 20:41	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 20:41	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 20:41	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 20:41	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 20:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*		*02/25/21 20:41*	*1*
4-Bromofluorobenzene (Surr)	*98*		*47 - 134*		*02/25/21 20:41*	*1*
Toluene-d8 (Surr)	*95*		*69 - 122*		*02/25/21 20:41*	*1*
Dibromofluoromethane (Surr)	*87*		*78 - 129*		*02/25/21 20:41*	*1*

Client Sample ID: MW-159S_021721
Lab Sample ID: 240-144660-2
Date Collected: 02/17/21 15:31
Matrix: Water
Date Received: 02/19/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 16:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/25/21 16:05*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 21:32	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 21:32	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 21:32	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 21:32	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 21:32	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 21:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*75 - 130*		*02/25/21 21:32*	*1*
4-Bromofluorobenzene (Surr)	*97*		*47 - 134*		*02/25/21 21:32*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*02/25/21 21:32*	*1*
Dibromofluoromethane (Surr)	*85*		*78 - 129*		*02/25/21 21:32*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144702-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/8/2021 10:52:49 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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Have a Question? Ask The Expert

Visit us at:
www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144702-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144702-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144702-1

Comments
No additional comments.

Receipt
The samples were received on 2/20/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.7° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144702-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144702-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144702-1	TRIP BLANK	Water	02/18/21 00:00	02/20/21 08:00	
240-144702-2	MW-185S_021821	Water	02/18/21 11:21	02/20/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144702-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144702-1

No Detections.

Client Sample ID: MW-185S_021821 — Lab Sample ID: 240-144702-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144702-1

Client Sample ID: TRIP BLANK
Date Collected: 02/18/21 00:00
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144702-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 14:45	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 14:45	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 14:45	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 14:45	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 14:45	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 14:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*02/26/21 14:45*	*1*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*		*02/26/21 14:45*	*1*
Toluene-d8 (Surr)	*91*		*69 - 122*		*02/26/21 14:45*	*1*
Dibromofluoromethane (Surr)	*100*		*78 - 129*		*02/26/21 14:45*	*1*

Client Sample ID: MW-185S_021821
Date Collected: 02/18/21 11:21
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144702-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 18:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/25/21 18:10*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 15:09	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 15:09	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 15:09	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 15:09	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 15:09	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 15:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*02/26/21 15:09*	*1*
4-Bromofluorobenzene (Surr)	*105*		*47 - 134*		*02/26/21 15:09*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*02/26/21 15:09*	*1*
Dibromofluoromethane (Surr)	*104*		*78 - 129*		*02/26/21 15:09*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144702-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144702-1	TRIP BLANK	101	103	91	100
240-144702-2	MW-185S_021821	101	105	92	104
240-144712-E-3 MS	Matrix Spike	92	103	94	93
240-144712-H-3 MSD	Matrix Spike Duplicate	93	103	94	94
LCS 240-474649/5	Lab Control Sample	93	103	93	94
MB 240-474649/8	Method Blank	101	103	91	103

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144568-J-3 MS	Matrix Spike	79
240-144568-J-3 MSD	Matrix Spike Duplicate	83
240-144702-2	MW-185S_021821	83
LCS 240-474490/4	Lab Control Sample	79
MB 240-474490/5	Method Blank	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474649/8
Matrix: Water
Analysis Batch: 474649

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 12:15	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 12:15	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 12:15	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 12:15	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 12:15	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 12:15	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*02/26/21 12:15*	*1*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*		*02/26/21 12:15*	*1*
Toluene-d8 (Surr)	*91*		*69 - 122*		*02/26/21 12:15*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*02/26/21 12:15*	*1*

Lab Sample ID: LCS 240-474649/5
Matrix: Water
Analysis Batch: 474649

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	20.0	20.0		ug/L		100	73 - 129
cis-1,2-Dichloroethene	20.0	19.8		ug/L		99	75 - 124
Tetrachloroethene	20.0	19.2		ug/L		96	70 - 125
trans-1,2-Dichloroethene	20.0	19.5		ug/L		97	74 - 130
Trichloroethene	20.0	18.2		ug/L		91	71 - 121
Vinyl chloride	20.0	23.3		ug/L		116	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*94*		*78 - 129*

Lab Sample ID: 240-144712-E-3 MS
Matrix: Water
Analysis Batch: 474649

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	20.0	19.7		ug/L		99	64 - 132
cis-1,2-Dichloroethene	1.0	U	20.0	20.1		ug/L		100	68 - 121
Tetrachloroethene	1.0	U	20.0	19.0		ug/L		95	52 - 129
trans-1,2-Dichloroethene	1.0	U	20.0	19.7		ug/L		98	69 - 126
Trichloroethene	1.0	U	20.0	17.6		ug/L		88	56 - 124
Vinyl chloride	1.0	U	20.0	25.7		ug/L		129	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*
Toluene-d8 (Surr)	*94*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144712-E-3 MS
Matrix: Water
Analysis Batch: 474649

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*93*		*78 - 129*

Lab Sample ID: 240-144712-H-3 MSD
Matrix: Water
Analysis Batch: 474649

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	20.0	20.7		ug/L		104	64 - 132	5	35
cis-1,2-Dichloroethene	1.0	U	20.0	21.0		ug/L		105	68 - 121	4	35
Tetrachloroethene	1.0	U	20.0	19.5		ug/L		97	52 - 129	2	35
trans-1,2-Dichloroethene	1.0	U	20.0	20.2		ug/L		101	69 - 126	3	35
Trichloroethene	1.0	U	20.0	19.0		ug/L		95	56 - 124	8	35
Vinyl chloride	1.0	U	20.0	25.1		ug/L		125	49 - 136	3	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*
Toluene-d8 (Surr)	*94*		*69 - 122*
Dibromofluoromethane (Surr)	*94*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474490/5
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 12:43	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/25/21 12:43*	*1*

Lab Sample ID: LCS 240-474490/4
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.7		ug/L		107	80 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*

Lab Sample ID: 240-144568-J-3 MS
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	10.2		ug/L		102	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*

Lab Sample ID: 240-144568-J-3 MSD
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.2		ug/L		102	46 - 170	0	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*

GC/MS VOA

Analysis Batch: 474490

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144702-2	MW-185S_021821	Total/NA	Water	8260B SIM	
MB 240-474490/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474490/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144568-J-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144568-J-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474649

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144702-1	TRIP BLANK	Total/NA	Water	8260B	
240-144702-2	MW-185S_021821	Total/NA	Water	8260B	
MB 240-474649/8	Method Blank	Total/NA	Water	8260B	
LCS 240-474649/5	Lab Control Sample	Total/NA	Water	8260B	
240-144712-E-3 MS	Matrix Spike	Total/NA	Water	8260B	
240-144712-H-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144702-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144702-1

Date Collected: 02/18/21 00:00

Matrix: Water

Date Received: 02/20/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474649	02/26/21 14:45	HMB	TAL CAN

Client Sample ID: MW-185S_021821

Lab Sample ID: 240-144702-2

Date Collected: 02/18/21 11:21

Matrix: Water

Date Received: 02/20/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474649	02/26/21 15:09	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		1	474490	02/25/21 18:10	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144702-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

MICHIGAN 190 TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: 10 day; ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client; Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1							X	X	X	X	X	X	X	1 Trip Blank
MW-1855_021821	02/18/21	11:21		X						6					N	G	X	X	X	X	X	X	X	Method 8260B * 8260B SIM

240-144702 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time	Received by	Company	Date/Time
Relinquished by: Gary Schafer	Arcadis	02/19/21 9:21	Novi cold storage	Arcadis	2/19/21 9:21
Relinquished by: Gary Schafer	Arcadis	2/19/21 10:11	Amanda Battistelli	ETA	2/19/21 10:11
Relinquished by: Amanda Battistelli	ETA	2/19/21 14:33	Received in Laboratory by:	TA	2-20-21 800

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3/8/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 144702
Canton Facility

Client Arcadis Site Name

Cooler Received on 2-20-21 Opened on 2-20-21

Cooler unpacked by:

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.6 °C Corrected Cooler Temp. 1.7 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC907861
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #	Yes	No
17. Was a LL Hg or Me Hg trip blank present?	Yes	No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container.
Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.
Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

DATA VERIFICATION REPORT

March 08, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144702-1
Sample date: 2021-02-18
Report received by CADENA: 2021-03-08
Initial Data Verification completed by CADENA: 2021-03-08
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144702-1

		Sample Name:	TRIP BLANK				MW-185S_021821			
		Lab Sample ID:	2401447021				2401447022			
		Sample Date:	2/18/2021				2/18/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

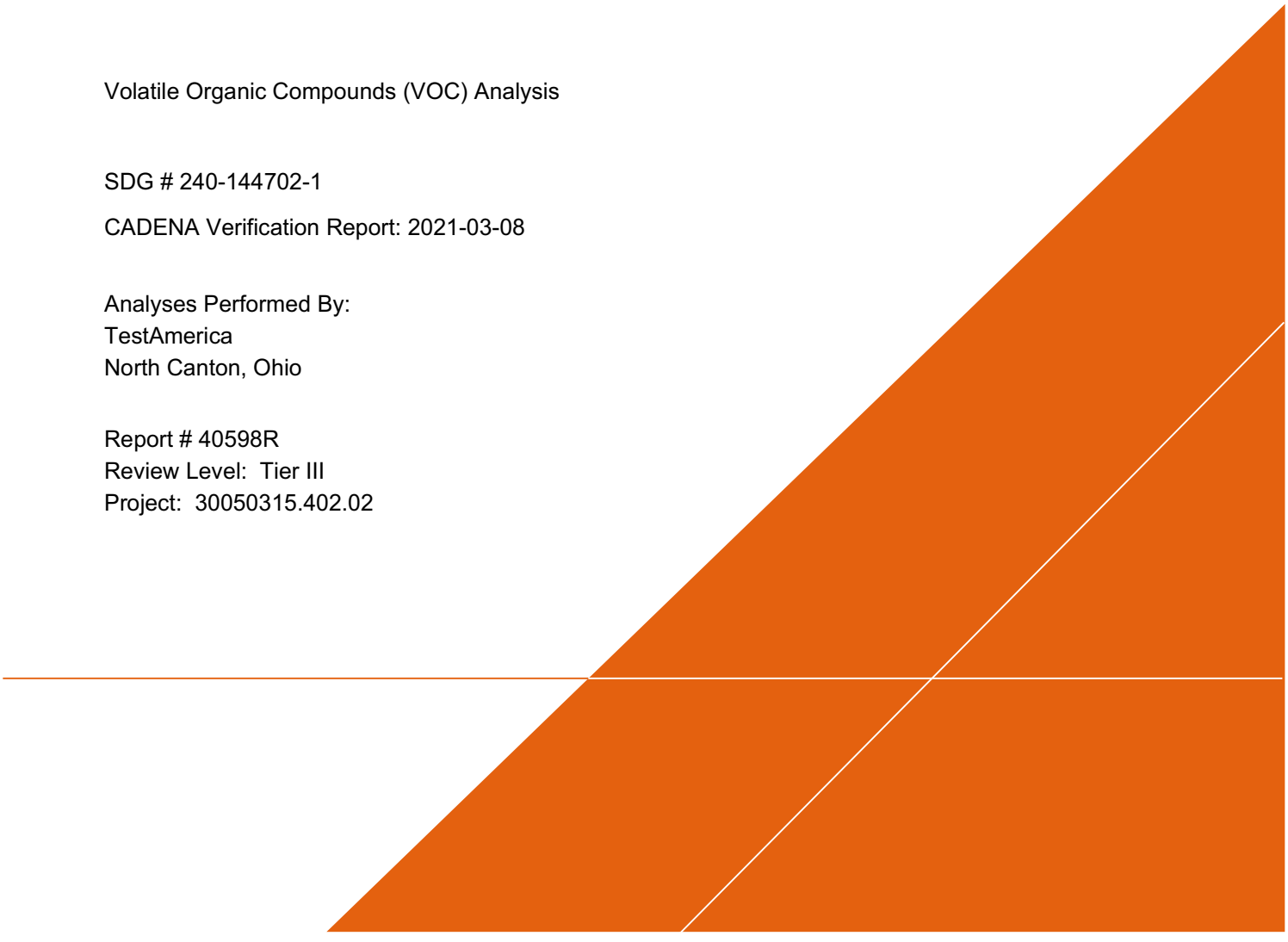
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144702-1

CADENA Verification Report: 2021-03-08

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40598R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144702-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144702-1	Water	02/18/2021		X	
MW-185S_021821	240-144702-2	Water	02/18/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 17, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 18, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190 TestAmerica — THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day — 10 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1							X	X	X	X	X	X	X	1. Trip Blank
MW-1855_021821	02/18/21	11:21		X						6					N	G	X	X	X	X	X	X	X	Method 8260B + 8260B SIM

Page 305 of 306

240-144702 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time	Received by	Company	Date/Time
Relinquished by: Gary Schafer	Arcadis	2/19/21 9:21	Novi cold storage	Arcadis	2/19/21 9:21
Relinquished by:	Arcadis	2/19/21 10:11		ETA	2/19/21 10:11
Relinquished by:	ETA	2/19/21 14:33	Received in Laboratory by:	TA	2-20-21 800

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03/08/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144702-1
Date Collected: 02/18/21 00:00
Matrix: Water
Date Received: 02/20/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 14:45	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 14:45	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 14:45	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 14:45	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 14:45	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 14:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*02/26/21 14:45*	*1*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*		*02/26/21 14:45*	*1*
Toluene-d8 (Surr)	*91*		*69 - 122*		*02/26/21 14:45*	*1*
Dibromofluoromethane (Surr)	*100*		*78 - 129*		*02/26/21 14:45*	*1*

Client Sample ID: MW-185S_021821
Lab Sample ID: 240-144702-2
Date Collected: 02/18/21 11:21
Matrix: Water
Date Received: 02/20/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 18:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/25/21 18:10*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 15:09	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 15:09	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 15:09	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 15:09	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 15:09	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 15:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*02/26/21 15:09*	*1*
4-Bromofluorobenzene (Surr)	*105*		*47 - 134*		*02/26/21 15:09*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*02/26/21 15:09*	*1*
Dibromofluoromethane (Surr)	*104*		*78 - 129*		*02/26/21 15:09*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144907-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/11/2021 4:30:00 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

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Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144907-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144907-1

Job ID: 240-144907-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144907-1

Comments
No additional comments.

Receipt
The samples were received on 2/25/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.7º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144907-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144907-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144907-1	TRIP BLANK	Water	02/23/21 00:00	02/25/21 08:00	
240-144907-2	MW-183S_022321	Water	02/23/21 13:40	02/25/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144907-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144907-1

No Detections.

Client Sample ID: MW-183S_022321 — Lab Sample ID: 240-144907-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144907-1

Client Sample ID: TRIP BLANK
Date Collected: 02/23/21 00:00
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144907-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 13:10	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 13:10	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 13:10	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 13:10	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 13:10	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 13:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*		*03/02/21 13:10*	*1*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*		*03/02/21 13:10*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*03/02/21 13:10*	*1*
Dibromofluoromethane (Surr)	*95*		*78 - 129*		*03/02/21 13:10*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144907-1

Client Sample ID: MW-183S_022321
Date Collected: 02/23/21 13:40
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144907-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 15:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 133*		*03/02/21 15:20*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 13:32	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 13:32	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 13:32	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 13:32	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 13:32	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 13:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*75 - 130*		*03/02/21 13:32*	*1*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*		*03/02/21 13:32*	*1*
Toluene-d8 (Surr)	*100*		*69 - 122*		*03/02/21 13:32*	*1*
Dibromofluoromethane (Surr)	*102*		*78 - 129*		*03/02/21 13:32*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144907-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144718-C-13 MS	Matrix Spike	97	95	99	99
240-144718-C-13 MSD	Matrix Spike Duplicate	97	89	97	99
240-144907-1	TRIP BLANK	97	89	93	95
240-144907-2	MW-183S_022321	102	88	100	102
LCS 240-475001/4	Lab Control Sample	92	88	92	97
MB 240-475001/6	Method Blank	100	85	95	99

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144907-2	MW-183S_022321	88
240-145076-O-2 MS	Matrix Spike	94
240-145076-O-2 MSD	Matrix Spike Duplicate	91
LCS 240-475052/4	Lab Control Sample	88
MB 240-475052/5	Method Blank	87

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475001/6
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 11:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 11:19	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 11:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 11:19	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 11:19	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 11:19	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*03/02/21 11:19*	*1*
4-Bromofluorobenzene (Surr)	*85*		*47 - 134*		*03/02/21 11:19*	*1*
Toluene-d8 (Surr)	*95*		*69 - 122*		*03/02/21 11:19*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*03/02/21 11:19*	*1*

Lab Sample ID: LCS 240-475001/4
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.92		ug/L		89	73 - 129
cis-1,2-Dichloroethene	10.0	9.98		ug/L		100	75 - 124
Tetrachloroethene	10.0	9.61		ug/L		96	70 - 125
trans-1,2-Dichloroethene	10.0	9.73		ug/L		97	74 - 130
Trichloroethene	10.0	9.44		ug/L		94	71 - 121
Vinyl chloride	10.0	9.30		ug/L		93	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*
Toluene-d8 (Surr)	*92*		*69 - 122*
Dibromofluoromethane (Surr)	*97*		*78 - 129*

Lab Sample ID: 240-144718-C-13 MS
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25	U	250	217		ug/L		87	64 - 132
cis-1,2-Dichloroethene	25	U	250	230		ug/L		92	68 - 121
Tetrachloroethene	5.3	J	250	231		ug/L		90	52 - 129
trans-1,2-Dichloroethene	25	U	250	224		ug/L		90	69 - 126
Trichloroethene	510		250	655		ug/L		57	56 - 124
Vinyl chloride	25	U	250	208		ug/L		83	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*99*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144718-C-13 MS
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*99*		*78 - 129*

Lab Sample ID: 240-144718-C-13 MSD
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	25	U	250	236		ug/L		94	64 - 132	8	35
cis-1,2-Dichloroethene	25	U	250	241		ug/L		97	68 - 121	5	35
Tetrachloroethene	5.3	J	250	251		ug/L		98	52 - 129	9	35
trans-1,2-Dichloroethene	25	U	250	236		ug/L		94	69 - 126	5	35
Trichloroethene	510		250	728		ug/L		86	56 - 124	11	35
Vinyl chloride	25	U	250	256		ug/L		103	49 - 136	21	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*
Toluene-d8 (Surr)	*97*		*69 - 122*
Dibromofluoromethane (Surr)	*99*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475052/5
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 12:26	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*70 - 133*		*03/02/21 12:26*	*1*

Lab Sample ID: LCS 240-475052/4
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.00		ug/L		90	80 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 133*

Lab Sample ID: 240-145076-O-2 MS
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	9.73		ug/L		97	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 133*

Lab Sample ID: 240-145076-O-2 MSD
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.82		ug/L		98	46 - 170	1	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*91*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144907-1

GC/MS VOA

Analysis Batch: 475001

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144907-1	TRIP BLANK	Total/NA	Water	8260B	
240-144907-2	MW-183S_022321	Total/NA	Water	8260B	
MB 240-475001/6	Method Blank	Total/NA	Water	8260B	
LCS 240-475001/4	Lab Control Sample	Total/NA	Water	8260B	
240-144718-C-13 MS	Matrix Spike	Total/NA	Water	8260B	
240-144718-C-13 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 475052

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144907-2	MW-183S_022321	Total/NA	Water	8260B SIM	
MB 240-475052/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-475052/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-145076-O-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-145076-O-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144907-1

Client Sample ID: TRIP BLANK
Date Collected: 02/23/21 00:00
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144907-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475001	03/02/21 13:10	LEE	TAL CAN

Client Sample ID: MW-183S_022321
Date Collected: 02/23/21 13:40
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144907-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475001	03/02/21 13:32	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	475052	03/02/21 15:20	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144907-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

MICHIGAN TestAmerica 190

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No:
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day	of COCs
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		For lab use only
Project Number: 30050315.402.04	Shipping/Tracking No:		Walk-in client
PO # 30050315.402.04			Lab sampling
			Job/SDG No:

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-183S_022321	2/23/21	1340		6						6					N	G	X	X	X	X	X	X	X	3 vocs for 8260B 3 vocs for 8260B SIM

240-144907 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested

Relinquished by: Emma Witherspoon	Company: Arcadis	Date/Time: 2/23/21 1800	Received by: Novi cold Storage	Company: Arcadis	Date/Time: 2/23/21 1800
Relinquished by: Julia McClafferty	Company: Arcadis	Date/Time: 2/24/2021	Received by: Amanda Battershell	Company: ETA	Date/Time: 2/24/21 1004
Relinquished by: Amanda Battershell	Company: ETA	Date/Time: 2/24/21 1401	Received in Laboratory by:	Company: TA	Date/Time: 2-25-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 144907
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Ryan C

Cooler Received on 2-25-21 Opened on 2-25-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2.6 °C Corrected Cooler Temp. 2.7 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 59072 (Yes) No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

March 11, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144907-1
Sample date: 2021-02-23
Report received by CADENA: 2021-03-11
Initial Data Verification completed by CADENA: 2021-03-11
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144907-1

		Sample Name:	TRIP BLANK				MW-183S_022321			
		Lab Sample ID:	2401449071				2401449072			
		Sample Date:	2/23/2021				2/23/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

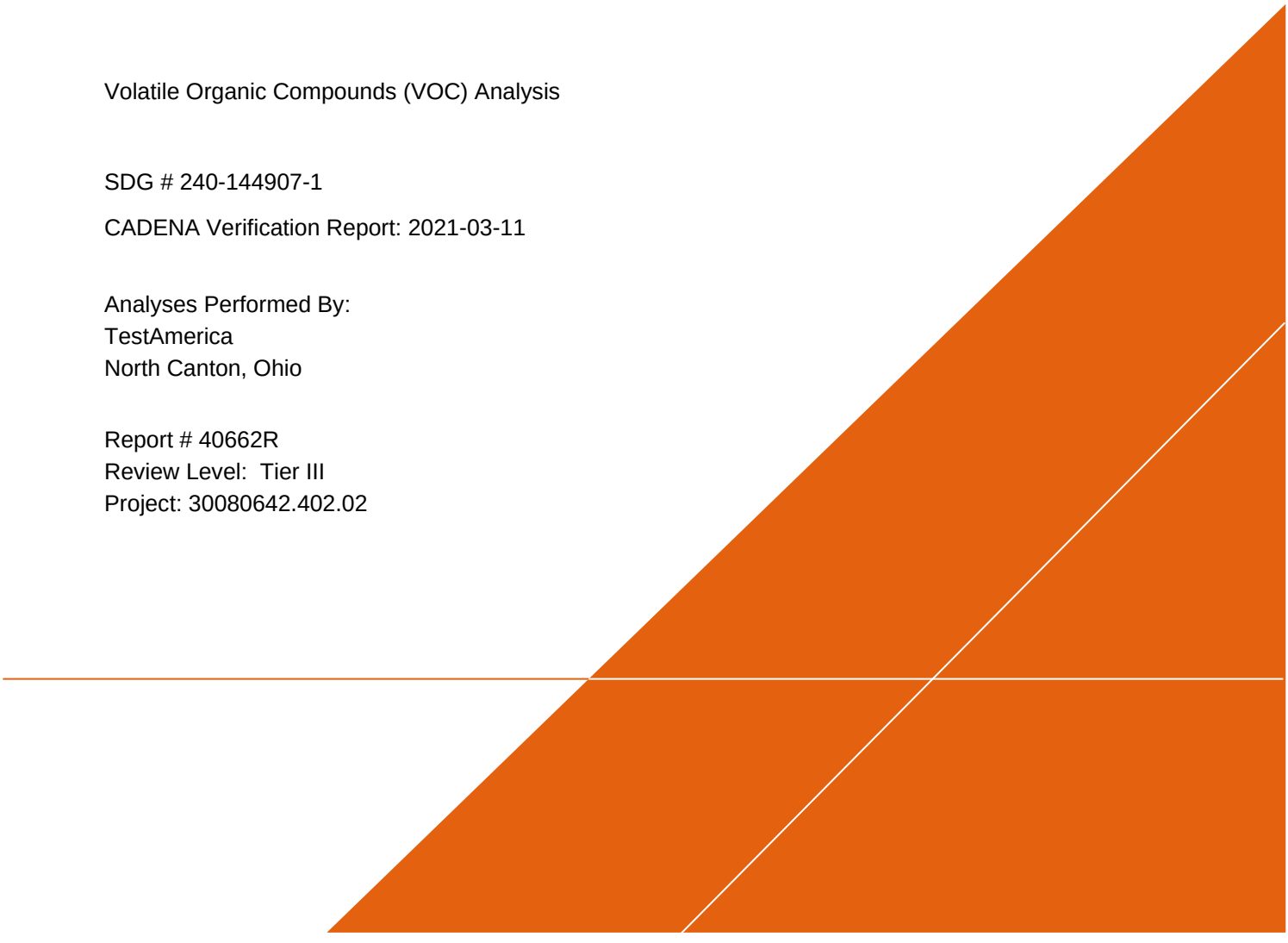
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144907-1

CADENA Verification Report: 2021-03-11

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40662R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144907-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144907-1	Water	02/23/2021		X	
MW-183S_022321	240-144907-2	Water	02/23/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

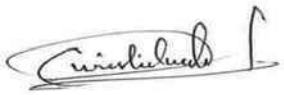
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 23, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 24, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN TestAmerica 190

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Emma Witherspoon	TAT if different from below		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:	10 day (3 weeks, 2 weeks, 1 week, 2 days, 1 day)		Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-183S_022321	2/23/21	1340		6						6					N	G	X	X	X	X	X	X	X	3 vocs for 8260B 3 vocs for 8260B SIM

240-144907 Chain of Custody

Possible Hazard Identification: Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client Disposal By Lab Archive For Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Emma Witherspoon	Arcadis	2/23/21 1800	Novi cold Storage	Arcadis	2/23/21 1800
Julia McClafferty	Arcadis	2/24/2021	Amanda Battershell	ETA	2/24/21 10:04
Amanda Battershell	ETA	2/24/21 1401	Received in Laboratory by:	TA	2-25-21 8:00

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03/11/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144907-1
Date Collected: 02/23/21 00:00
Matrix: Water
Date Received: 02/25/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 13:10	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 13:10	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 13:10	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 13:10	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 13:10	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 13:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*		*03/02/21 13:10*	*1*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*		*03/02/21 13:10*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*03/02/21 13:10*	*1*
Dibromofluoromethane (Surr)	*95*		*78 - 129*		*03/02/21 13:10*	*1*

Client Sample ID: MW-183S_022321
Lab Sample ID: 240-144907-2
Date Collected: 02/23/21 13:40
Matrix: Water
Date Received: 02/25/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 15:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 133*		*03/02/21 15:20*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 13:32	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 13:32	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 13:32	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 13:32	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 13:32	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 13:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*75 - 130*		*03/02/21 13:32*	*1*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*		*03/02/21 13:32*	*1*
Toluene-d8 (Surr)	*100*		*69 - 122*		*03/02/21 13:32*	*1*
Dibromofluoromethane (Surr)	*102*		*78 - 129*		*03/02/21 13:32*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144914-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Jennifer Stiller

Authorized for release by:
3/18/2021 10:45:24 AM
Jennifer Stiller, Project Management Assistant II
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Designee for

Michael DelMonico, Project Manager I
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Michael.DelMonico@Eurofinset.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144914-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144914-1

Job ID: 240-144914-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144914-1

Comments
No additional comments.

Receipt
The samples were received on 2/25/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.7º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144914-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144914-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144914-1	TRIP BLANK	Water	02/23/21 00:00	02/25/21 08:00	
240-144914-2	MW-112S_022321	Water	02/23/21 14:50	02/25/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144914-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144914-1

No Detections.

Client Sample ID: MW-112S_022321 — Lab Sample ID: 240-144914-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144914-1

Client Sample ID: TRIP BLANK

Date Collected: 02/23/21 00:00
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144914-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U H	1.0	0.19	ug/L			03/11/21 15:09	1
cis-1,2-Dichloroethene	1.0	U H	1.0	0.16	ug/L			03/11/21 15:09	1
Tetrachloroethene	1.0	U H	1.0	0.15	ug/L			03/11/21 15:09	1
trans-1,2-Dichloroethene	1.0	U H	1.0	0.19	ug/L			03/11/21 15:09	1
Trichloroethene	1.0	U H	1.0	0.10	ug/L			03/11/21 15:09	1
Vinyl chloride	1.0	U H	1.0	0.20	ug/L			03/11/21 15:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*75 - 130*		*03/11/21 15:09*	*1*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*		*03/11/21 15:09*	*1*
Toluene-d8 (Surr)	*96*		*69 - 122*		*03/11/21 15:09*	*1*
Dibromofluoromethane (Surr)	*85*		*78 - 129*		*03/11/21 15:09*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144914-1

Client Sample ID: MW-112S_022321
Date Collected: 02/23/21 14:50
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144914-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 17:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*70 - 133*		*03/02/21 17:49*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 17:58	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 17:58	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 17:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 17:58	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 17:58	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 17:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*		*03/02/21 17:58*	*1*
4-Bromofluorobenzene (Surr)	*86*		*47 - 134*		*03/02/21 17:58*	*1*
Toluene-d8 (Surr)	*96*		*69 - 122*		*03/02/21 17:58*	*1*
Dibromofluoromethane (Surr)	*93*		*78 - 129*		*03/02/21 17:58*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144914-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144718-C-13 MS	Matrix Spike	97	95	99	99
240-144718-C-13 MSD	Matrix Spike Duplicate	97	89	97	99
240-144914-1	TRIP BLANK	79	95	96	85
240-144914-2	MW-112S_022321	97	86	96	93
LCS 240-475001/4	Lab Control Sample	92	88	92	97
LCS 240-476417/4	Lab Control Sample	82	97	94	89
MB 240-475001/6	Method Blank	100	85	95	99
MB 240-476417/7	Method Blank	79	97	94	87

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144914-2	MW-112S_022321	89
240-145076-O-2 MS	Matrix Spike	94
240-145076-O-2 MSD	Matrix Spike Duplicate	91
LCS 240-475052/4	Lab Control Sample	88
MB 240-475052/5	Method Blank	87

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475001/6
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 11:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 11:19	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 11:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 11:19	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 11:19	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 11:19	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*03/02/21 11:19*	*1*
4-Bromofluorobenzene (Surr)	*85*		*47 - 134*		*03/02/21 11:19*	*1*
Toluene-d8 (Surr)	*95*		*69 - 122*		*03/02/21 11:19*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*03/02/21 11:19*	*1*

Lab Sample ID: LCS 240-475001/4
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.92		ug/L		89	73 - 129
cis-1,2-Dichloroethene	10.0	9.98		ug/L		100	75 - 124
Tetrachloroethene	10.0	9.61		ug/L		96	70 - 125
trans-1,2-Dichloroethene	10.0	9.73		ug/L		97	74 - 130
Trichloroethene	10.0	9.44		ug/L		94	71 - 121
Vinyl chloride	10.0	9.30		ug/L		93	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*
Toluene-d8 (Surr)	*92*		*69 - 122*
Dibromofluoromethane (Surr)	*97*		*78 - 129*

Lab Sample ID: 240-144718-C-13 MS
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25	U	250	217		ug/L		87	64 - 132
cis-1,2-Dichloroethene	25	U	250	230		ug/L		92	68 - 121
Tetrachloroethene	5.3	J	250	231		ug/L		90	52 - 129
trans-1,2-Dichloroethene	25	U	250	224		ug/L		90	69 - 126
Trichloroethene	510		250	655		ug/L		57	56 - 124
Vinyl chloride	25	U	250	208		ug/L		83	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*99*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144718-C-13 MS
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	99		78 - 129

Lab Sample ID: 240-144718-C-13 MSD
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	25	U	250	236		ug/L		94	64 - 132	8	35
cis-1,2-Dichloroethene	25	U	250	241		ug/L		97	68 - 121	5	35
Tetrachloroethene	5.3	J	250	251		ug/L		98	52 - 129	9	35
trans-1,2-Dichloroethene	25	U	250	236		ug/L		94	69 - 126	5	35
Trichloroethene	510		250	728		ug/L		86	56 - 124	11	35
Vinyl chloride	25	U	250	256		ug/L		103	49 - 136	21	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	97		75 - 130
4-Bromofluorobenzene (Surr)	89		47 - 134
Toluene-d8 (Surr)	97		69 - 122
Dibromofluoromethane (Surr)	99		78 - 129

Lab Sample ID: MB 240-476417/7
Matrix: Water
Analysis Batch: 476417

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/11/21 14:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/11/21 14:19	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/11/21 14:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/11/21 14:19	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/11/21 14:19	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/11/21 14:19	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	79		75 - 130		03/11/21 14:19	1
4-Bromofluorobenzene (Surr)	97		47 - 134		03/11/21 14:19	1
Toluene-d8 (Surr)	94		69 - 122		03/11/21 14:19	1
Dibromofluoromethane (Surr)	87		78 - 129		03/11/21 14:19	1

Lab Sample ID: LCS 240-476417/4
Matrix: Water
Analysis Batch: 476417

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.68		ug/L		87	73 - 129
cis-1,2-Dichloroethene	10.0	9.28		ug/L		93	75 - 124
Tetrachloroethene	10.0	9.89		ug/L		99	70 - 125
trans-1,2-Dichloroethene	10.0	9.06		ug/L		91	74 - 130
Trichloroethene	10.0	8.69		ug/L		87	71 - 121

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-476417/4
Matrix: Water
Analysis Batch: 476417

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Vinyl chloride			10.0	11.1		ug/L		111	61 - 134		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*75 - 130*
4-Bromofluorobenzene (Surr)	*97*		*47 - 134*
Toluene-d8 (Surr)	*94*		*69 - 122*
Dibromofluoromethane (Surr)	*89*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475052/5
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 12:26	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*70 - 133*		*03/02/21 12:26*	*1*

Lab Sample ID: LCS 240-475052/4
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	9.00		ug/L		90	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 133*

Lab Sample ID: 240-145076-O-2 MS
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	9.73		ug/L		97	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 133*

Lab Sample ID: 240-145076-O-2 MSD
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.82		ug/L		98	46 - 170	1	26

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-145076-O-2 MSD
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*91*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144914-1

GC/MS VOA

Analysis Batch: 475001

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144914-2	MW-112S_022321	Total/NA	Water	8260B	
MB 240-475001/6	Method Blank	Total/NA	Water	8260B	
LCS 240-475001/4	Lab Control Sample	Total/NA	Water	8260B	
240-144718-C-13 MS	Matrix Spike	Total/NA	Water	8260B	
240-144718-C-13 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 475052

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144914-2	MW-112S_022321	Total/NA	Water	8260B SIM	
MB 240-475052/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-475052/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-145076-O-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-145076-O-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 476417

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144914-1	TRIP BLANK	Total/NA	Water	8260B	
MB 240-476417/7	Method Blank	Total/NA	Water	8260B	
LCS 240-476417/4	Lab Control Sample	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144914-1

Client Sample ID: TRIP BLANK
Date Collected: 02/23/21 00:00
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144914-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	476417	03/11/21 15:09	LRW	TAL CAN

Client Sample ID: MW-112S_022321
Date Collected: 02/23/21 14:50
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144914-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475001	03/02/21 17:58	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	475052	03/02/21 17:49	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144914-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

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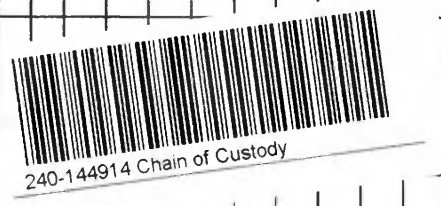
TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Allyson Hartz	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client:
Phone: 248-994-2240	Method of Shipment/Carrier:	10 day		Lab sampling:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	6	X	X	X	X	X	X	X	1 tripblank
MW-1125-022321	2/23/21	14:50		6						6					N	6	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM



Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
A Hartz	Arcadis	2/23/21 16:30	No, cold storage	Arcadis	2/23/21 16:30
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[illegible]	Arcadis	2/24/2021	Amanda Battershell	ETA	2/24/21 1004
Relinquished by: Amanda Battershell	Company: ETA	Date/Time: 2/24/21 1404	Received in Laboratory by:	Company: TA	Date/Time: 2-25-21 800

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3/18/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 144914
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Ryan C

Cooler Received on 2-25-21 Opened on 2-25-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2.6 °C Corrected Cooler Temp. 2.7 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# **HC907861**
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 58306 (Yes) No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT



March 18, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144914-1
Sample date: 2021-02-23
Report received by CADENA: 2021-03-18
Initial Data Verification completed by CADENA: 2021-03-18
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

HTQ - GCMS VOC sample TRIP BLANK analyses were performed outside of reference holding time so all associated results should be considered to be estimated and qualified with UJ flags if non-detect.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Qualified Results Summary

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144914-1

Sample Name: TRIP BLANK
Lab Sample ID: 2401449141
Sample Date: 2/23/2021

Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC					
OSW-8260B					
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	UJ
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	UJ
Tetrachloroethene	127-18-4	ND	1.0	ug/l	UJ
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	UJ
Trichloroethene	79-01-6	ND	1.0	ug/l	UJ
Vinyl chloride	75-01-4	ND	1.0	ug/l	UJ

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144914-1

		Sample Name:	TRIP BLANK				MW-112S_022321			
		Lab Sample ID:	2401449141				2401449142			
		Sample Date:	2/23/2021				2/23/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS Design & Consultancy for natural and built assets

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

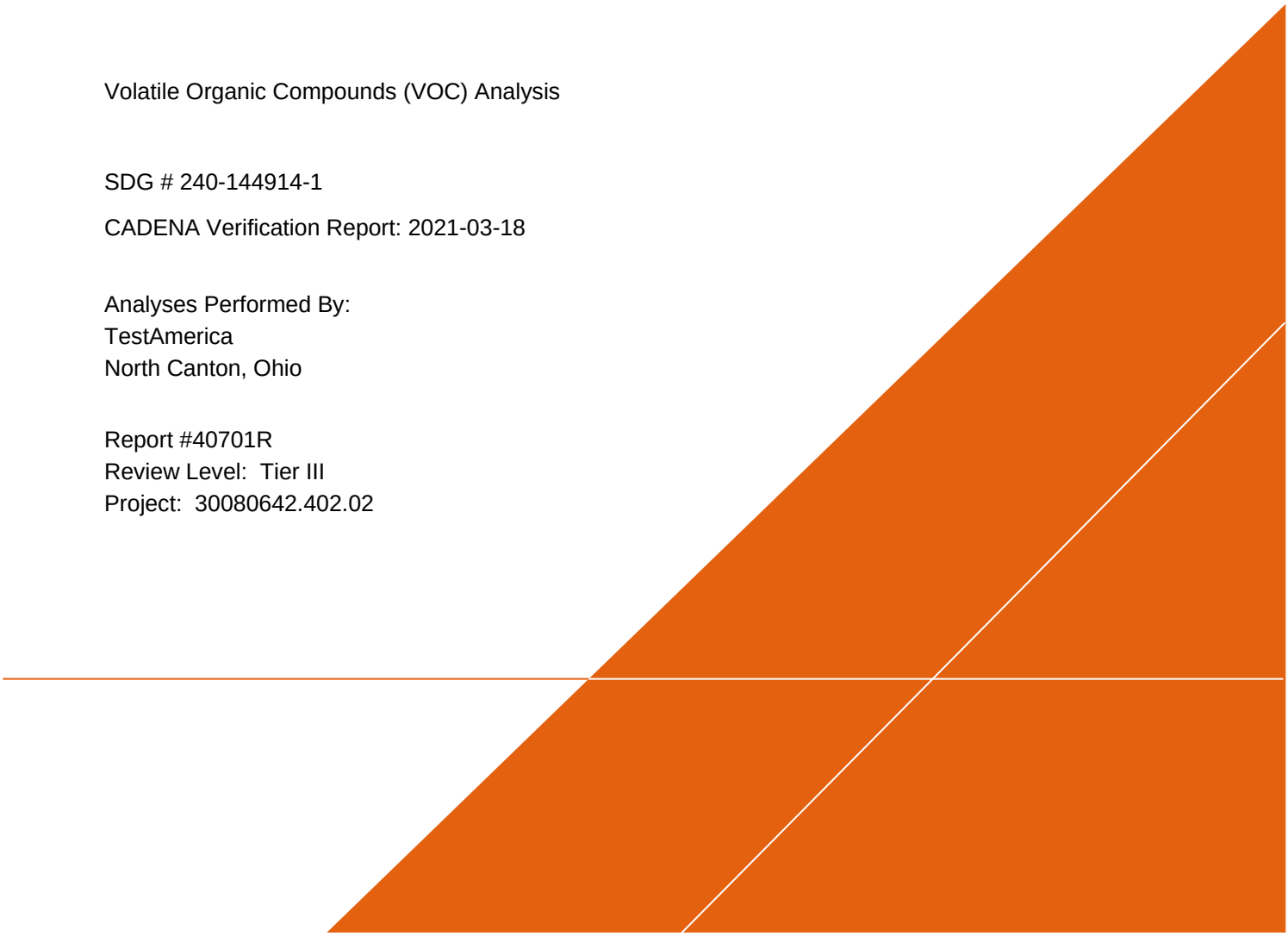
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144914-1

CADENA Verification Report: 2021-03-18

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report #40701R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144914-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					VOC
TRIP BLANK	240-144914-1	Water	02/23/2021		X
MW-112S_022321	240-144914-2	Water	02/23/2021		X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

The analyses that exceeded the holding are presented in the following table.

Sample ID	Holding Time	Criteria
TRIP BLANK	16 Days	14 days from collection to analysis

Sample results associated with sample locations analyzed by analytical method SW-846 8260B were qualified, as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area

counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X	X		
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Prashanth K

SIGNATURE: 

DATE: March 26, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 29, 2021

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

MICHIGAN 190

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Allyson Hartz	Analysis Turnaround Time	COC No: / of / COCs
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:	TAT if different from below: 10 day; ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day	For lab use only
Project Number: 30050315.402.04	Shipping/Tracking No:		Walk-in client
PO # 30050315.402.04			Lab sampling
			Job/SDG No:

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Acet	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	6	X	X	X	X	X	X	X	1 tripblank
MW-1125_022321	2/23/21	14:50		6						6					N	6	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-144914 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ An Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
A Hartz	Arcadis	2/23/21 16:30	Nav, cold storage	Arcadis	2/23/21 16:30
[signature]	Arcadis	2/24/2021	[signature]	ETA	2/24/21 1004
[signature]	ETA	2/24/21 1404	Received in Laboratory by: [signature]	TA	2-25-21 800

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144914-1
Date Collected: 02/23/21 00:00
Matrix: Water
Date Received: 02/25/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U H	1.0	0.19	ug/L			03/11/21 15:09	1
cis-1,2-Dichloroethene	1.0	U H	1.0	0.16	ug/L			03/11/21 15:09	1
Tetrachloroethene	1.0	U H	1.0	0.15	ug/L			03/11/21 15:09	1
trans-1,2-Dichloroethene	1.0	U H	1.0	0.19	ug/L			03/11/21 15:09	1
Trichloroethene	1.0	U H	1.0	0.10	ug/L			03/11/21 15:09	1
Vinyl chloride	1.0	U H	1.0	0.20	ug/L			03/11/21 15:09	1

UJ

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*75 - 130*		*03/11/21 15:09*	*1*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*		*03/11/21 15:09*	*1*
Toluene-d8 (Surr)	*96*		*69 - 122*		*03/11/21 15:09*	*1*
Dibromofluoromethane (Surr)	*85*		*78 - 129*		*03/11/21 15:09*	*1*

Client Sample ID: MW-112S_022321
Lab Sample ID: 240-144914-2
Date Collected: 02/23/21 14:50
Matrix: Water
Date Received: 02/25/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 17:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*70 - 133*		*03/02/21 17:49*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 17:58	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 17:58	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 17:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 17:58	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 17:58	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 17:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*		*03/02/21 17:58*	*1*
4-Bromofluorobenzene (Surr)	*86*		*47 - 134*		*03/02/21 17:58*	*1*
Toluene-d8 (Surr)	*96*		*69 - 122*		*03/02/21 17:58*	*1*
Dibromofluoromethane (Surr)	*93*		*78 - 129*		*03/02/21 17:58*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-145160-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/12/2021 4:53:49 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
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Have a Question? Ask The Expert
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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145160-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-145160-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-145160-1

Comments
No additional comments.

Receipt
The samples were received on 3/2/2021 9:15 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.1° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145160-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145160-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-145160-1	TRIP BLANK	Water	02/26/21 00:00	03/02/21 09:15	
240-145160-2	MW-217S_022621	Water	02/26/21 10:53	03/02/21 09:15	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145160-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-145160-1

No Detections.

Client Sample ID: MW-217S_022621 — Lab Sample ID: 240-145160-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145160-1

Client Sample ID: TRIP BLANK

Date Collected: 02/26/21 00:00
Date Received: 03/02/21 09:15

Lab Sample ID: 240-145160-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 22:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 22:07	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 22:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 22:07	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 22:07	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 22:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*75 - 130*		*03/03/21 22:07*	*1*
4-Bromofluorobenzene (Surr)	*67*		*47 - 134*		*03/03/21 22:07*	*1*
Toluene-d8 (Surr)	*79*		*69 - 122*		*03/03/21 22:07*	*1*
Dibromofluoromethane (Surr)	*114*		*78 - 129*		*03/03/21 22:07*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145160-1

Client Sample ID: MW-217S_022621
Date Collected: 02/26/21 10:53
Date Received: 03/02/21 09:15

Lab Sample ID: 240-145160-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/04/21 18:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*70 - 133*		*03/04/21 18:06*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 22:31	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 22:31	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 22:31	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 22:31	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 22:31	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 22:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*114*		*75 - 130*		*03/03/21 22:31*	*1*
4-Bromofluorobenzene (Surr)	*64*		*47 - 134*		*03/03/21 22:31*	*1*
Toluene-d8 (Surr)	*94*		*69 - 122*		*03/03/21 22:31*	*1*
Dibromofluoromethane (Surr)	*102*		*78 - 129*		*03/03/21 22:31*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145160-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-145090-C-1 MS	Matrix Spike	90	89	100	92
240-145090-D-1 MSD	Matrix Spike Duplicate	96	91	90	96
240-145160-1	TRIP BLANK	116	67	79	114
240-145160-2	MW-217S_022621	114	64	94	102
LCS 240-475282/4	Lab Control Sample	86	103	87	87
MB 240-475282/7	Method Blank	108	59	73	109

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-145160-2	MW-217S_022621	100
240-145164-J-2 MS	Matrix Spike	94
240-145164-J-2 MSD	Matrix Spike Duplicate	96
LCS 240-475458/4	Lab Control Sample	84
MB 240-475458/5	Method Blank	87

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475282/7
Matrix: Water
Analysis Batch: 475282

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 14:34	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 14:34	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 14:34	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 14:34	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 14:34	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 14:34	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*75 - 130*		*03/03/21 14:34*	*1*
4-Bromofluorobenzene (Surr)	*59*		*47 - 134*		*03/03/21 14:34*	*1*
Toluene-d8 (Surr)	*73*		*69 - 122*		*03/03/21 14:34*	*1*
Dibromofluoromethane (Surr)	*109*		*78 - 129*		*03/03/21 14:34*	*1*

Lab Sample ID: LCS 240-475282/4
Matrix: Water
Analysis Batch: 475282

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.97		ug/L		100	73 - 129
cis-1,2-Dichloroethene	10.0	8.42		ug/L		84	75 - 124
Tetrachloroethene	10.0	11.3		ug/L		113	70 - 125
trans-1,2-Dichloroethene	10.0	8.77		ug/L		88	74 - 130
Trichloroethene	10.0	10.1		ug/L		101	71 - 121
Vinyl chloride	10.0	9.57		ug/L		96	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*
Toluene-d8 (Surr)	*87*		*69 - 122*
Dibromofluoromethane (Surr)	*87*		*78 - 129*

Lab Sample ID: 240-145090-C-1 MS
Matrix: Water
Analysis Batch: 475282

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	2.5		10.0	11.9		ug/L		95	64 - 132
cis-1,2-Dichloroethene	7.8		10.0	17.1		ug/L		93	68 - 121
Tetrachloroethene	2.3	F1	10.0	15.5	F1	ug/L		132	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	10.2		ug/L		102	69 - 126
Trichloroethene	3.4		10.0	12.8		ug/L		94	56 - 124
Vinyl chloride	1.0	U	10.0	11.1		ug/L		111	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*75 - 130*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*
Toluene-d8 (Surr)	*100*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-145090-C-1 MS
Matrix: Water
Analysis Batch: 475282

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*92*		*78 - 129*

Lab Sample ID: 240-145090-D-1 MSD
Matrix: Water
Analysis Batch: 475282

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	2.5		10.0	14.1		ug/L		116	64 - 132	16	35
cis-1,2-Dichloroethene	7.8		10.0	17.4		ug/L		96	68 - 121	2	35
Tetrachloroethene	2.3	F1	10.0	14.0		ug/L		117	52 - 129	10	35
trans-1,2-Dichloroethene	1.0	U	10.0	12.0		ug/L		120	69 - 126	16	35
Trichloroethene	3.4		10.0	13.0		ug/L		97	56 - 124	2	35
Vinyl chloride	1.0	U	10.0	11.3		ug/L		113	49 - 136	2	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*96*		*75 - 130*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*
Toluene-d8 (Surr)	*90*		*69 - 122*
Dibromofluoromethane (Surr)	*96*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475458/5
Matrix: Water
Analysis Batch: 475458

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/04/21 11:50	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*70 - 133*		*03/04/21 11:50*	*1*

Lab Sample ID: LCS 240-475458/4
Matrix: Water
Analysis Batch: 475458

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	8.91		ug/L		89	80 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*

Lab Sample ID: 240-145164-J-2 MS
Matrix: Water
Analysis Batch: 475458

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	8.58		ug/L		86	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 133*

Lab Sample ID: 240-145164-J-2 MSD
Matrix: Water
Analysis Batch: 475458

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	8.65		ug/L		86	46 - 170	1	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*96*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145160-1

GC/MS VOA

Analysis Batch: 475282

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-145160-1	TRIP BLANK	Total/NA	Water	8260B	
240-145160-2	MW-217S_022621	Total/NA	Water	8260B	
MB 240-475282/7	Method Blank	Total/NA	Water	8260B	
LCS 240-475282/4	Lab Control Sample	Total/NA	Water	8260B	
240-145090-C-1 MS	Matrix Spike	Total/NA	Water	8260B	
240-145090-D-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 475458

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-145160-2	MW-217S_022621	Total/NA	Water	8260B SIM	
MB 240-475458/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-475458/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-145164-J-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-145164-J-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145160-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-145160-1

Date Collected: 02/26/21 00:00

Matrix: Water

Date Received: 03/02/21 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475282	03/03/21 22:07	LRW	TAL CAN

Client Sample ID: MW-217S_022621

Lab Sample ID: 240-145160-2

Date Collected: 02/26/21 10:53

Matrix: Water

Date Received: 03/02/21 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475282	03/03/21 22:31	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	475458	03/04/21 18:06	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145160-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

MICHIGAN 190 TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Kara Darschwe	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client:
Phone: 248-994-2240	Method of Shipment/Carrier:	10 day		Lab sampling:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-217S_022621	2/26/21	1053		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-145160 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	2/26/21 1730	Novi Cold Storage	Arcadis	2/26/21 1730
Relinquished by: RACHEL BELAK	Company: ARCADIS	Date/Time: 3/1/21 1100	Received by: Amanda Battershell	Company: ETA	Date/Time: 3/1/21 11:01
Relinquished by: Amanda Battershell	Company: ETA	Date/Time: 3/1/21 1253	Received in Laboratory by:	Company: ETA	Date/Time: 3-2-21 915

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3/12/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 141516
Canton Facility

Client Arcadis Site Name

Cooler unpacked by: Mathis

Cooler Received on 3-2-21 Opened on 3-2-21

FedEx: 1st (Grd) Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # 17 Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2.0 °C Corrected Cooler Temp. 2.1 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? (Yes) No
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# **HC022887**
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #0212301F (Yes) No
17. Was a LL Hg or Me Hg trip blank present? ____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

WI-NC-099

DATA VERIFICATION REPORT



March 13, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 145160-1
Sample date: 2021-02-26
Report received by CADENA: 2021-03-12
Initial Data Verification completed by CADENA: 2021-03-13
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch MS/MSD recovery outliers were not determined using a client sample so qualification was not required based on these sample-specific QC outliers.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 145160-1

		Sample Name:	TRIP BLANK				MW-217S_022621			
		Lab Sample ID:	2401451601				2401451602			
		Sample Date:	2/26/2021				2/26/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS Design & Consultancy for natural and built assets

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

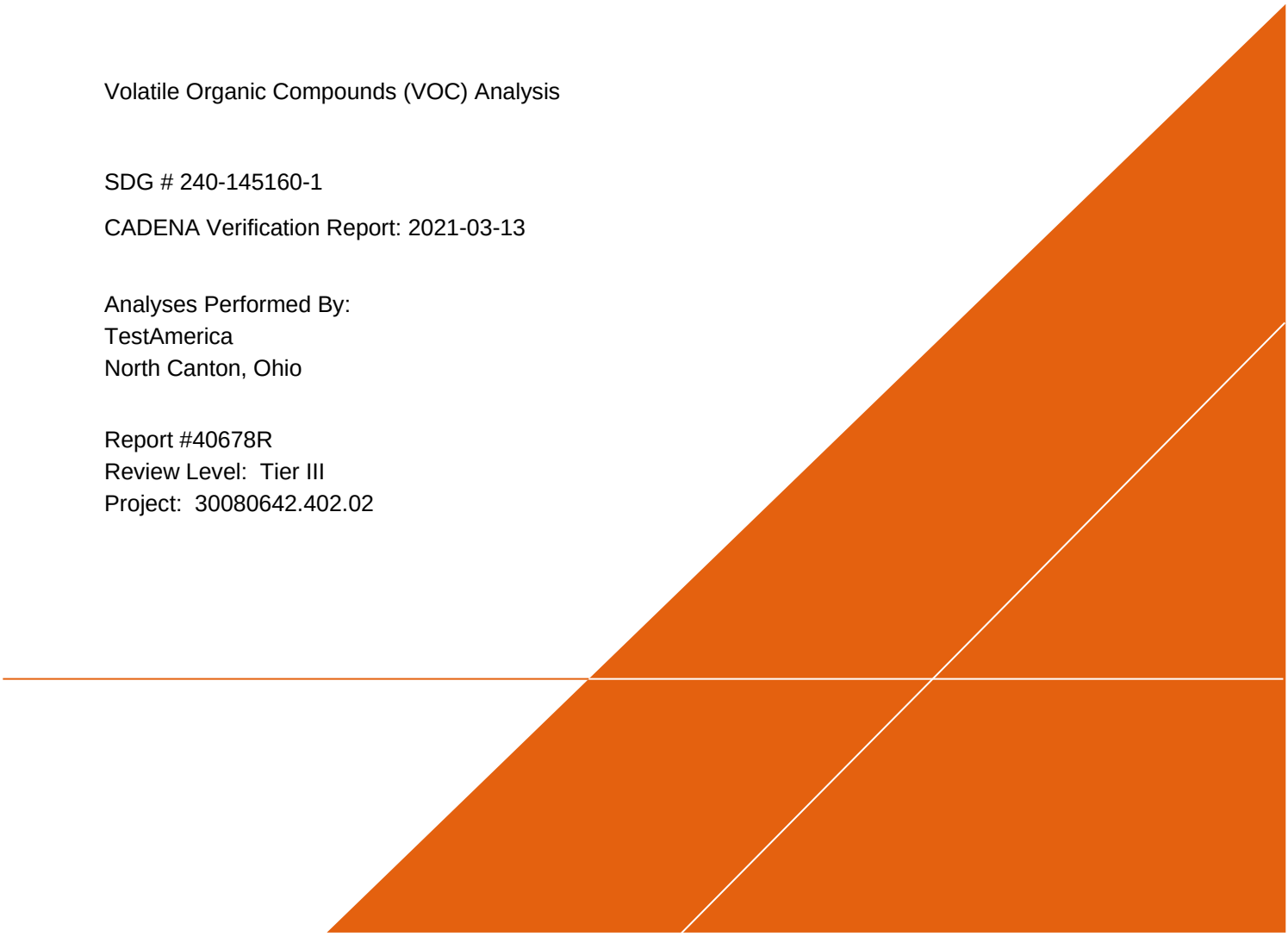
Volatile Organic Compounds (VOC) Analysis

SDG # 240-145160-1

CADENA Verification Report: 2021-03-13

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report #40678R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-145160-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					VOC
TRIP BLANK	240-145160-1	Water	02/26/2021		X
MW-217S_022621	240-145160-2	Water	02/26/2021		X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial/Continuing	Compound	Criteria
MW-217S_022621	CCV %D	Tetrachloroethene	+33.2%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action

Initial/Continuing	Criteria	Sample Result	Qualification
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1] RRF of 0.01 only applies to compounds which are typically poor responding compounds (i.e., ketones, 1,4-dioxane, etc.)

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Prashanth K

SIGNATURE: 

DATE: March 26, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 29, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190 TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Kara Donahue	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling:
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-217S_022621	2/26/21	1053		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-145160 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalla@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	2/26/21 1730	Novi Cold Storage	Arcadis	2/26/21 1730
Relinquished by: RACHEL BELAK	Company: ARCADIS	Date/Time: 3/1/21 1100	Received by: Amanda Battershell	Company: ETA	Date/Time: 3/1/21 11:01
Relinquished by: Amanda Battershell	Company: ETA	Date/Time: 3/1/21 1253	Received in Laboratory by:	Company: ETA	Date/Time: 3-2-21 915

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-145160-1

Date Collected: 02/26/21 00:00
Matrix: Water
Date Received: 03/02/21 09:15

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 22:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 22:07	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 22:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 22:07	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 22:07	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 22:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*75 - 130*		*03/03/21 22:07*	*1*
4-Bromofluorobenzene (Surr)	*67*		*47 - 134*		*03/03/21 22:07*	*1*
Toluene-d8 (Surr)	*79*		*69 - 122*		*03/03/21 22:07*	*1*
Dibromofluoromethane (Surr)	*114*		*78 - 129*		*03/03/21 22:07*	*1*

Client Sample ID: MW-217S_022621
Lab Sample ID: 240-145160-2

Date Collected: 02/26/21 10:53
Matrix: Water
Date Received: 03/02/21 09:15

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/04/21 18:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*70 - 133*		*03/04/21 18:06*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 22:31	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 22:31	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 22:31	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 22:31	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 22:31	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 22:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*114*		*75 - 130*		*03/03/21 22:31*	*1*
4-Bromofluorobenzene (Surr)	*64*		*47 - 134*		*03/03/21 22:31*	*1*
Toluene-d8 (Surr)	*94*		*69 - 122*		*03/03/21 22:31*	*1*
Dibromofluoromethane (Surr)	*102*		*78 - 129*		*03/03/21 22:31*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-145161-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/12/2021 4:52:38 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145161-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-145161-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-145161-1

Comments
No additional comments.

Receipt
The samples were received on 3/2/2021 9:15 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.1° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145161-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145161-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-145161-1	TRIP BLANK	Water	02/26/21 00:00	03/02/21 09:15	
240-145161-2	MW-89S_022621	Water	02/26/21 13:16	03/02/21 09:15	
240-145161-3	MW-193S_022621	Water	02/26/21 11:46	03/02/21 09:15	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145161-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-145161-1

No Detections.

Client Sample ID: MW-89S_022621 — Lab Sample ID: 240-145161-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	1.1		1.0	0.16	ug/L	1		8260B	Total/NA

Client Sample ID: MW-193S_022621 — Lab Sample ID: 240-145161-3

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145161-1

Client Sample ID: TRIP BLANK
Date Collected: 02/26/21 00:00
Date Received: 03/02/21 09:15

Lab Sample ID: 240-145161-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 17:29	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/04/21 17:29	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/04/21 17:29	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 17:29	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/04/21 17:29	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/04/21 17:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*03/04/21 17:29*	*1*
4-Bromofluorobenzene (Surr)	*72*		*47 - 134*		*03/04/21 17:29*	*1*
Toluene-d8 (Surr)	*81*		*69 - 122*		*03/04/21 17:29*	*1*
Dibromofluoromethane (Surr)	*107*		*78 - 129*		*03/04/21 17:29*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145161-1

Client Sample ID: MW-89S_022621

Date Collected: 02/26/21 13:16
Date Received: 03/02/21 09:15

Lab Sample ID: 240-145161-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/04/21 18:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*70 - 133*		*03/04/21 18:31*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 17:53	1
cis-1,2-Dichloroethene	**1.1**		1.0	0.16	ug/L			03/04/21 17:53	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/04/21 17:53	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 17:53	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/04/21 17:53	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/04/21 17:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*109*		*75 - 130*		*03/04/21 17:53*	*1*
4-Bromofluorobenzene (Surr)	*63*		*47 - 134*		*03/04/21 17:53*	*1*
Toluene-d8 (Surr)	*82*		*69 - 122*		*03/04/21 17:53*	*1*
Dibromofluoromethane (Surr)	*106*		*78 - 129*		*03/04/21 17:53*	*1*

Client Sample ID: MW-193S_022621
Date Collected: 02/26/21 11:46
Date Received: 03/02/21 09:15

Lab Sample ID: 240-145161-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/04/21 18:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*70 - 133*		*03/04/21 18:56*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 18:17	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/04/21 18:17	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/04/21 18:17	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 18:17	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/04/21 18:17	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/04/21 18:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*109*		*75 - 130*		*03/04/21 18:17*	*1*
4-Bromofluorobenzene (Surr)	*69*		*47 - 134*		*03/04/21 18:17*	*1*
Toluene-d8 (Surr)	*79*		*69 - 122*		*03/04/21 18:17*	*1*
Dibromofluoromethane (Surr)	*111*		*78 - 129*		*03/04/21 18:17*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145161-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-145161-1	TRIP BLANK	104	72	81	107
240-145161-2	MW-89S_022621	109	63	82	106
240-145161-3	MW-193S_022621	109	69	79	111
240-145164-M-2 MS	Matrix Spike	95	93	89	92
240-145164-N-2 MSD	Matrix Spike Duplicate	84	85	87	90
LCS 240-475466/4	Lab Control Sample	84	87	86	88
MB 240-475466/7	Method Blank	106	64	79	109

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-145161-2	MW-89S_022621	97
240-145161-3	MW-193S_022621	98
240-145164-J-2 MS	Matrix Spike	94
240-145164-J-2 MSD	Matrix Spike Duplicate	96
LCS 240-475458/4	Lab Control Sample	84
MB 240-475458/5	Method Blank	87

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475466/7
Matrix: Water
Analysis Batch: 475466

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 16:39	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/04/21 16:39	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/04/21 16:39	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 16:39	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/04/21 16:39	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/04/21 16:39	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*75 - 130*		*03/04/21 16:39*	*1*
4-Bromofluorobenzene (Surr)	*64*		*47 - 134*		*03/04/21 16:39*	*1*
Toluene-d8 (Surr)	*79*		*69 - 122*		*03/04/21 16:39*	*1*
Dibromofluoromethane (Surr)	*109*		*78 - 129*		*03/04/21 16:39*	*1*

Lab Sample ID: LCS 240-475466/4
Matrix: Water
Analysis Batch: 475466

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	11.0		ug/L		110	73 - 129
cis-1,2-Dichloroethene	10.0	9.51		ug/L		95	75 - 124
Tetrachloroethene	10.0	12.0		ug/L		120	70 - 125
trans-1,2-Dichloroethene	10.0	10.3		ug/L		103	74 - 130
Trichloroethene	10.0	9.56		ug/L		96	71 - 121
Vinyl chloride	10.0	10.8		ug/L		108	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*
Toluene-d8 (Surr)	*86*		*69 - 122*
Dibromofluoromethane (Surr)	*88*		*78 - 129*

Lab Sample ID: 240-145164-M-2 MS
Matrix: Water
Analysis Batch: 475466

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	11.0		ug/L		110	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	9.35		ug/L		93	68 - 121
Tetrachloroethene	1.0	U	10.0	12.4		ug/L		124	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	10.6		ug/L		106	69 - 126
Trichloroethene	1.0	U	10.0	9.05		ug/L		90	56 - 124
Vinyl chloride	1.0	U	10.0	10.9		ug/L		109	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*95*		*75 - 130*
4-Bromofluorobenzene (Surr)	*93*		*47 - 134*
Toluene-d8 (Surr)	*89*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-145164-M-2 MS
Matrix: Water
Analysis Batch: 475466

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*92*		*78 - 129*

Lab Sample ID: 240-145164-N-2 MSD
Matrix: Water
Analysis Batch: 475466

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.07		ug/L		91	64 - 132	19	35
cis-1,2-Dichloroethene	1.0	U	10.0	8.16		ug/L		82	68 - 121	14	35
Tetrachloroethene	1.0	U	10.0	10.4		ug/L		104	52 - 129	18	35
trans-1,2-Dichloroethene	1.0	U	10.0	8.75		ug/L		87	69 - 126	20	35
Trichloroethene	1.0	U	10.0	9.44		ug/L		94	56 - 124	4	35
Vinyl chloride	1.0	U	10.0	9.34		ug/L		93	49 - 136	15	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*
4-Bromofluorobenzene (Surr)	*85*		*47 - 134*
Toluene-d8 (Surr)	*87*		*69 - 122*
Dibromofluoromethane (Surr)	*90*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475458/5
Matrix: Water
Analysis Batch: 475458

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/04/21 11:50	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*70 - 133*		*03/04/21 11:50*	*1*

Lab Sample ID: LCS 240-475458/4
Matrix: Water
Analysis Batch: 475458

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	8.91		ug/L		89	80 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*

Lab Sample ID: 240-145164-J-2 MS
Matrix: Water
Analysis Batch: 475458

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	8.58		ug/L		86	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 133*

Lab Sample ID: 240-145164-J-2 MSD
Matrix: Water
Analysis Batch: 475458

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	8.65		ug/L		86	46 - 170	1	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*96*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145161-1

GC/MS VOA

Analysis Batch: 475458

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-145161-2	MW-89S_022621	Total/NA	Water	8260B SIM	
240-145161-3	MW-193S_022621	Total/NA	Water	8260B SIM	
MB 240-475458/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-475458/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-145164-J-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-145164-J-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 475466

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-145161-1	TRIP BLANK	Total/NA	Water	8260B	
240-145161-2	MW-89S_022621	Total/NA	Water	8260B	
240-145161-3	MW-193S_022621	Total/NA	Water	8260B	
MB 240-475466/7	Method Blank	Total/NA	Water	8260B	
LCS 240-475466/4	Lab Control Sample	Total/NA	Water	8260B	
240-145164-M-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-145164-N-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145161-1

Client Sample ID: TRIP BLANK
Date Collected: 02/26/21 00:00
Date Received: 03/02/21 09:15

Lab Sample ID: 240-145161-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475466	03/04/21 17:29	LRW	TAL CAN

Client Sample ID: MW-89S_022621
Date Collected: 02/26/21 13:16
Date Received: 03/02/21 09:15

Lab Sample ID: 240-145161-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475466	03/04/21 17:53	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	475458	03/04/21 18:31	SAM	TAL CAN

Client Sample ID: MW-193S_022621
Date Collected: 02/26/21 11:46
Date Received: 03/02/21 09:15

Lab Sample ID: 240-145161-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475466	03/04/21 18:17	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	475458	03/04/21 18:56	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145161-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

MICHIGAN 190 TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Gary Schafer	TAT if different from below: 10 day; 3 weeks / 2 weeks / 1 week / 2 days / 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/26/21									1							X	X	X	X	X	X	X	
MW-895_022621	02/26/21	13:16		X						B					N	G	X	X	X	X	X	X	X	Method 8260B " 8260B Sim
MW-1935_022621	02/26/21	11:46		X						6					N	G	X	X	X	X	X	X	X	Method 8260B " 8260B Sim

240-145161 Chain of Custody

Possible Hazard Identification: Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / Disposal By Lab / Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	02/26/21 14:20	Novi Cold Storage	Arcadis	02/26/21 14:21
Relinquished by: RACHEL BIELAK	Company: ARCADIS	Date/Time: 3/1/21 1100	Received by: Amanda Butterfield	Company: ETA	Date/Time: 3/1/21 11:01
Relinquished by: Amanda Butterfield	Company: ETA	Date/Time: 3/1/21 1253	Received in Laboratory by:	Company: ETA	Date/Time: 3-2-21 915

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3/12/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 145161
Canton Facility

Client Arcadis Site Name

Cooler unpacked by: Mathew

Cooler Received on 3-2-21 Opened on 3-2-21

FedEx: 1st (Grd) Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # 17 Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2.0 °C Corrected Cooler Temp. 2.1 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? (Yes) No
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# **HC022887**
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #021281F (Yes) No
17. Was a LL Hg or Me Hg trip blank present? ____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

WI-NC-099

DATA VERIFICATION REPORT

March 13, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 145161-1
Sample date: 2021-02-26
Report received by CADENA: 2021-03-12
Initial Data Verification completed by CADENA: 2021-03-13
Number of Samples:3
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 145161-1

		Sample Name:	TRIP BLANK				MW-89S_022621				MW-193S_022621			
		Lab Sample ID:	2401451611				2401451612				2401451613			
		Sample Date:	2/26/2021				2/26/2021				2/26/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC													
OSW-8260B													
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	1.1	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim													
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS Design & Consultancy for natural and built assets

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

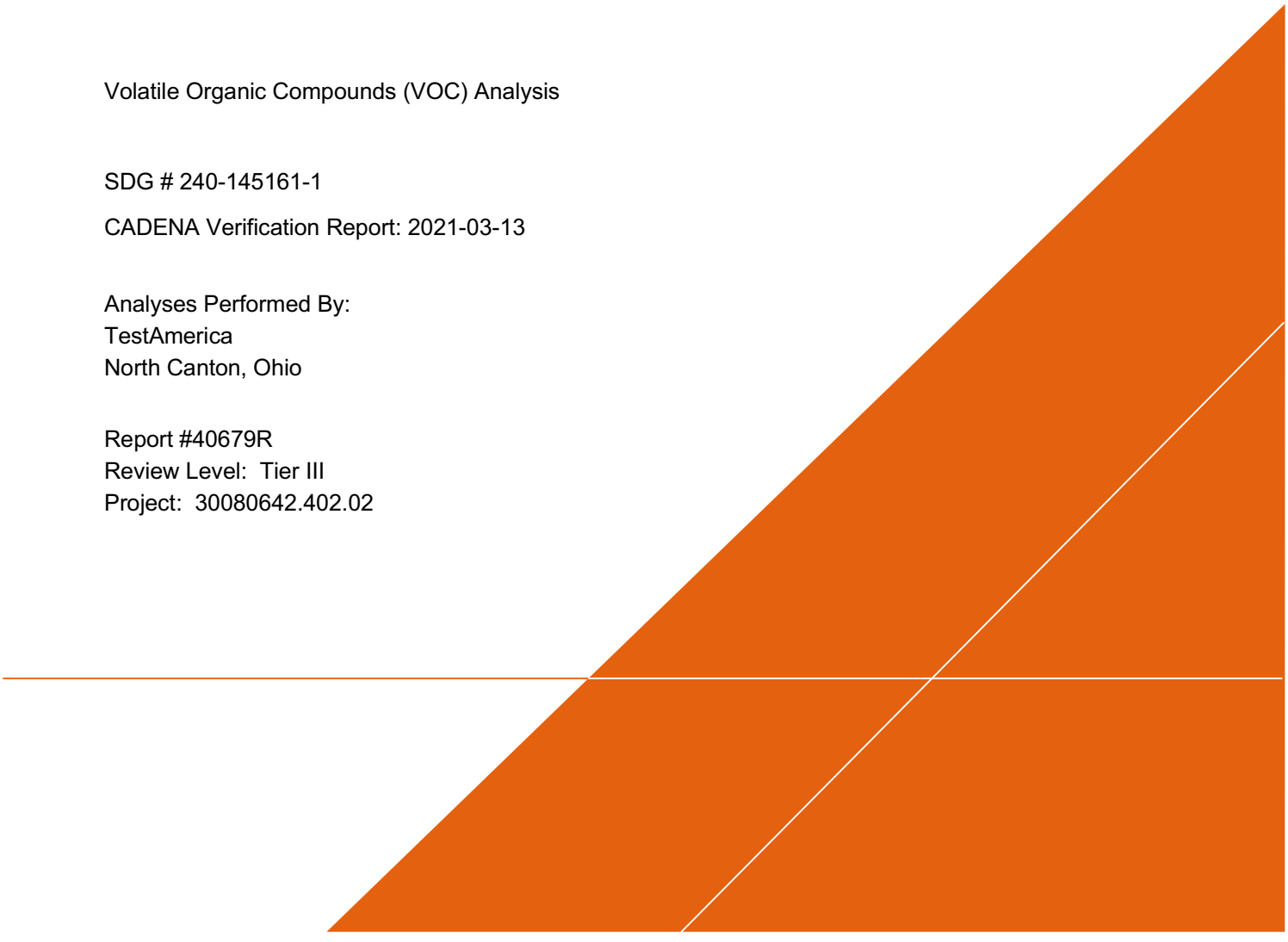
Volatile Organic Compounds (VOC) Analysis

SDG # 240-145161-1

CADENA Verification Report: 2021-03-13

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report #40679R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-145161-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					VOC
TRIP BLANK	240-145161-1	Water	02/26/2021		X
MW-89S_022621	240-145161-2	Water	02/26/2021		X
MW-193S_022621	240-145161-3	Water	02/26/2021		X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial/Continuing	Compound	Criteria
MW-217S_022621	CCV %D	Tetrachloroethene	+33.2%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action

Initial/Continuing	Criteria	Sample Result	Qualification
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1] RRF of 0.01 only applies to compounds which are typically poor responding compounds (i.e., ketones, 1,4-dioxane, etc.)

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Prashanth K

SIGNATURE: 

DATE: March 26, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 29, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190 TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Gary Schafer	TAT if different from below: 10 day; 3 weeks / 2 weeks / 1 week / 2 days / 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/26/21									1							X	X	X	X	X	X	X	
MW-895_022621	02/26/21	13:16		X						6					N	G	X	X	X	X	X	X	X	Method 8260B || 8260B Sim
MW-1935_022621	02/26/21	11:46		X						6					N	G	X	X	X	X	X	X	X	Method 8260B || 8260B Sim

240-145161 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	02/26/21 14:20	Novi Cold Storage	Arcadis	02/26/21 14:21
Rachel Bielak	ARCADIS	3/1/21 1100	Amanda Butterfield	ETA	3/1/21 11:01
Amanda Butterfield	ETA	3/1/21 1253		ETA	3-2-21 915

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03/12/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-145161-1
Date Collected: 02/26/21 00:00
Matrix: Water
Date Received: 03/02/21 09:15

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 17:29	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/04/21 17:29	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/04/21 17:29	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 17:29	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/04/21 17:29	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/04/21 17:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*03/04/21 17:29*	*1*
4-Bromofluorobenzene (Surr)	*72*		*47 - 134*		*03/04/21 17:29*	*1*
Toluene-d8 (Surr)	*81*		*69 - 122*		*03/04/21 17:29*	*1*
Dibromofluoromethane (Surr)	*107*		*78 - 129*		*03/04/21 17:29*	*1*

Client Sample ID: MW-89S_022621
Lab Sample ID: 240-145161-2
Date Collected: 02/26/21 13:16
Matrix: Water
Date Received: 03/02/21 09:15

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/04/21 18:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*70 - 133*		*03/04/21 18:31*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 17:53	1
cis-1,2-Dichloroethene	**1.1**		1.0	0.16	ug/L			03/04/21 17:53	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/04/21 17:53	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 17:53	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/04/21 17:53	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/04/21 17:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*109*		*75 - 130*		*03/04/21 17:53*	*1*
4-Bromofluorobenzene (Surr)	*63*		*47 - 134*		*03/04/21 17:53*	*1*
Toluene-d8 (Surr)	*82*		*69 - 122*		*03/04/21 17:53*	*1*
Dibromofluoromethane (Surr)	*106*		*78 - 129*		*03/04/21 17:53*	*1*

Client Sample ID: MW-193S_022621
Lab Sample ID: 240-145161-3
Date Collected: 02/26/21 11:46
Matrix: Water
Date Received: 03/02/21 09:15

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/04/21 18:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*70 - 133*		*03/04/21 18:56*	*1*

Client Sample ID: MW-193S_022621
Lab Sample ID: 240-145161-3

Date Collected: 02/26/21 11:46
Matrix: Water
Date Received: 03/02/21 09:15

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 18:17	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/04/21 18:17	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/04/21 18:17	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 18:17	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/04/21 18:17	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/04/21 18:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*109*		*75 - 130*		*03/04/21 18:17*	*1*
4-Bromofluorobenzene (Surr)	*69*		*47 - 134*		*03/04/21 18:17*	*1*
Toluene-d8 (Surr)	*79*		*69 - 122*		*03/04/21 18:17*	*1*
Dibromofluoromethane (Surr)	*111*		*78 - 129*		*03/04/21 18:17*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144656-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/5/2021 2:16:12 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144656-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144656-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144656-1

Comments
No additional comments.

Receipt
The samples were received on 2/19/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.5° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144656-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144656-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144656-1	TRIP BLANK	Water	02/17/21 00:00	02/19/21 08:00	
240-144656-2	MW-158S_021721	Water	02/17/21 10:51	02/19/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144656-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144656-1

No Detections.

Client Sample ID: MW-158S_021721 — Lab Sample ID: 240-144656-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144656-1

Client Sample ID: TRIP BLANK
Date Collected: 02/17/21 00:00
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144656-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 15:00	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 15:00	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 15:00	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 15:00	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 15:00	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 15:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*75 - 130*		*02/26/21 15:00*	*1*
4-Bromofluorobenzene (Surr)	*84*		*47 - 134*		*02/26/21 15:00*	*1*
Toluene-d8 (Surr)	*95*		*69 - 122*		*02/26/21 15:00*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*02/26/21 15:00*	*1*

Client Sample ID: MW-158S_021721
Date Collected: 02/17/21 10:51
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144656-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 14:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/25/21 14:49*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 15:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 15:22	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 15:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 15:22	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 15:22	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 15:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*109*		*75 - 130*		*02/26/21 15:22*	*1*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*		*02/26/21 15:22*	*1*
Toluene-d8 (Surr)	*102*		*69 - 122*		*02/26/21 15:22*	*1*
Dibromofluoromethane (Surr)	*109*		*78 - 129*		*02/26/21 15:22*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144656-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144638-B-2 MS	Matrix Spike	97	87	94	98
240-144638-B-2 MSD	Matrix Spike Duplicate	98	92	99	98
240-144656-1	TRIP BLANK	103	84	95	99
240-144656-2	MW-158S_021721	109	89	102	109
LCS 240-474629/4	Lab Control Sample	95	92	95	98
MB 240-474629/6	Method Blank	95	83	94	92

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144568-J-3 MS	Matrix Spike	79
240-144568-J-3 MSD	Matrix Spike Duplicate	83
240-144656-2	MW-158S_021721	82
LCS 240-474490/4	Lab Control Sample	79
MB 240-474490/5	Method Blank	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474629/6
Matrix: Water
Analysis Batch: 474629

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 11:41	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 11:41	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 11:41	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 11:41	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 11:41	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 11:41	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*75 - 130*		*02/26/21 11:41*	*1*
4-Bromofluorobenzene (Surr)	*83*		*47 - 134*		*02/26/21 11:41*	*1*
Toluene-d8 (Surr)	*94*		*69 - 122*		*02/26/21 11:41*	*1*
Dibromofluoromethane (Surr)	*92*		*78 - 129*		*02/26/21 11:41*	*1*

Lab Sample ID: LCS 240-474629/4
Matrix: Water
Analysis Batch: 474629

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.40		ug/L		84	73 - 129
cis-1,2-Dichloroethene	10.0	9.53		ug/L		95	75 - 124
Tetrachloroethene	10.0	9.23		ug/L		92	70 - 125
trans-1,2-Dichloroethene	10.0	9.32		ug/L		93	74 - 130
Trichloroethene	10.0	9.32		ug/L		93	71 - 121
Vinyl chloride	10.0	9.30		ug/L		93	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*95*		*75 - 130*
4-Bromofluorobenzene (Surr)	*92*		*47 - 134*
Toluene-d8 (Surr)	*95*		*69 - 122*
Dibromofluoromethane (Surr)	*98*		*78 - 129*

Lab Sample ID: 240-144638-B-2 MS
Matrix: Water
Analysis Batch: 474629

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*
Toluene-d8 (Surr)	*94*		*69 - 122*
Dibromofluoromethane (Surr)	*98*		*78 - 129*

Lab Sample ID: 240-144638-B-2 MSD
Matrix: Water
Analysis Batch: 474629

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 130*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144638-B-2 MSD
Matrix: Water
Analysis Batch: 474629

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*92*		*47 - 134*
Toluene-d8 (Surr)	*99*		*69 - 122*
Dibromofluoromethane (Surr)	*98*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474490/5
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 12:43	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/25/21 12:43*	*1*

Lab Sample ID: LCS 240-474490/4
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.7		ug/L		107	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*

Lab Sample ID: 240-144568-J-3 MS
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	10.2		ug/L		102	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*

Lab Sample ID: 240-144568-J-3 MSD
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.2		ug/L		102	46 - 170	0	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*

GC/MS VOA

Analysis Batch: 474490

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144656-2	MW-158S_021721	Total/NA	Water	8260B SIM	
MB 240-474490/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474490/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144568-J-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144568-J-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474629

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144656-1	TRIP BLANK	Total/NA	Water	8260B	
240-144656-2	MW-158S_021721	Total/NA	Water	8260B	
MB 240-474629/6	Method Blank	Total/NA	Water	8260B	
LCS 240-474629/4	Lab Control Sample	Total/NA	Water	8260B	
240-144638-B-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144638-B-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144656-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144656-1

Date Collected: 02/17/21 00:00

Matrix: Water

Date Received: 02/19/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474629	02/26/21 15:00	LEE	TAL CAN

Client Sample ID: MW-158S_021721

Lab Sample ID: 240-144656-2

Date Collected: 02/17/21 10:51

Matrix: Water

Date Received: 02/19/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474629	02/26/21 15:22	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	474490	02/25/21 14:49	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144656-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

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TestAmerica Laboratories, Inc.

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: 10 day; ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/17/21	—		X						1							X	X	X	X	X	X	X	1 trip blank
MW-1585-021721	02/17/21	10:51		X						6					N	G	X	X	X	X	X	X	X	Method 8260B - 3 VOAs; " 8260B SIM - 3 VOAs

240-144656 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	02/17/21 17:17	Novi cold storage	Arcadis	02/17/21 17:17
Julia McClafferty	Arcadis	2/18/2021	Amanda Battistelli	ETA	2/18/21 10:18
Amanda Battistelli	ETA	2/18/21 ~~11:38~~ 11:38	Received in Laboratory by:	Company: TA	Date/Time: 2.19.21 800

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3/5/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 144656
Canton Facility

Client Arcadis Site Name

Cooler Received on 2-19-21 Opened on 2-19-21

Cooler unpacked by:

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.4 °C Corrected Cooler Temp. 1.5 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present?	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container.
Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.
Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

DATA VERIFICATION REPORT

March 05, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144656-1
Sample date: 2021-02-17
Report received by CADENA: 2021-03-05
Initial Data Verification completed by CADENA: 2021-03-05
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144656-1

		Sample Name:	TRIP BLANK				MW-158S_021721			
		Lab Sample ID:	2401446561				2401446562			
		Sample Date:	2/17/2021				2/17/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

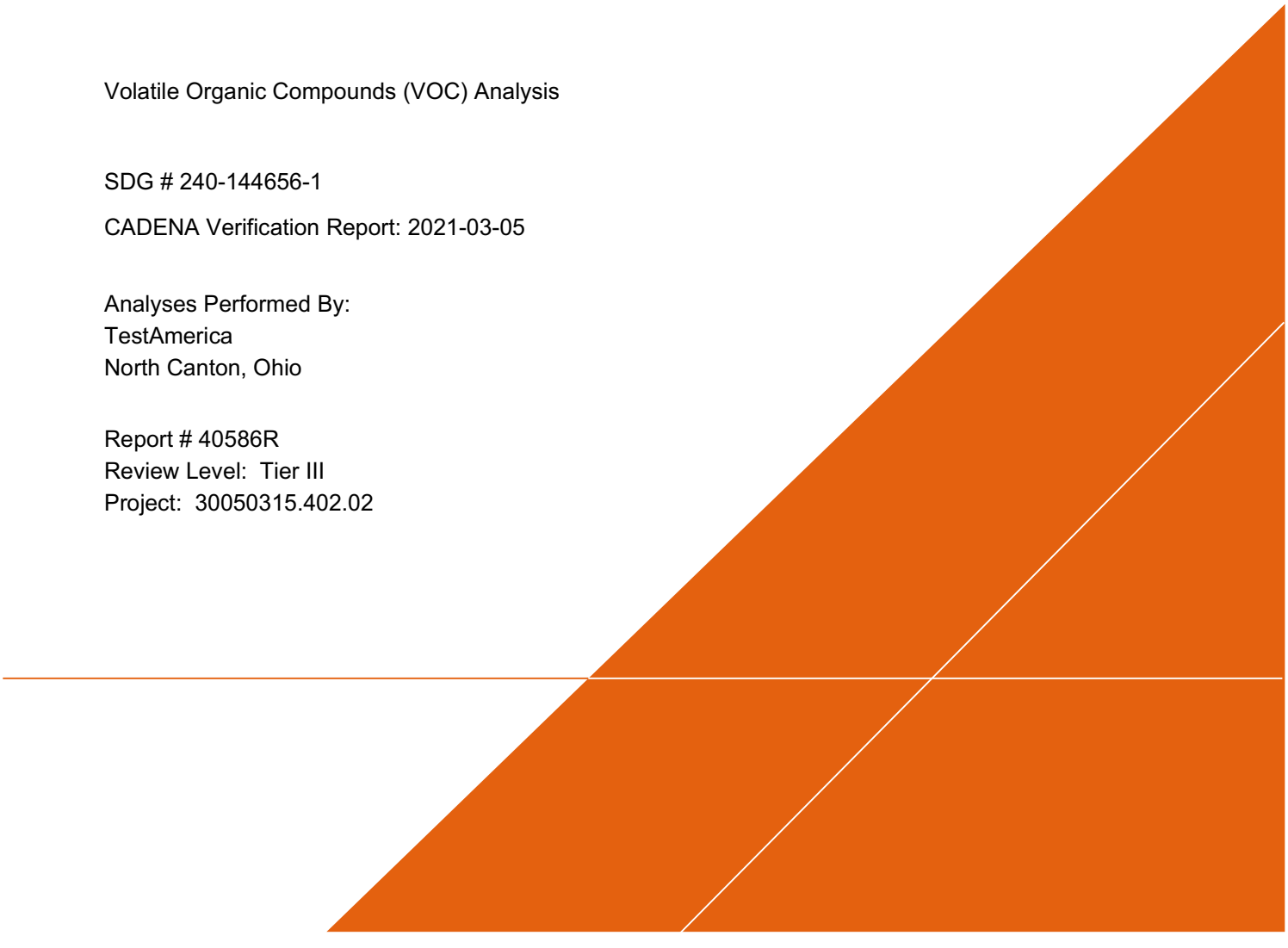
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144656-1

CADENA Verification Report: 2021-03-05

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40586R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144656-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144656-1	Water	02/17/2021		X	
MW-158S_021721	240-144656-2	Water	02/17/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 17, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 18, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

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TestAmerica Laboratories, Inc.

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day — 10 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/17/21	—		X						1							X	X	X	X	X	X	X	1 tripblank
MW-1585-021721	02/17/21	10:51		X						6					N	G	X	X	X	X	X	X	X	Method 8260B - 3 VOAs; " 8260B SIM - 3 VOAs

240-144656 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	2/17/21 17:17	Novi cond storage	Arcadis	2/17/21 17:17
Julia McClafferty	Arcadis	2/18/2021	Amanda Battistelli	ETA	2/18/21 10:18
Amanda Battistelli	ETA	2/18/21 ~~11:38~~ 11:38	Received in Laboratory by:	TA	2-19-21 800

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03/05/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144656-1

Date Collected: 02/17/21 00:00
Matrix: Water
Date Received: 02/19/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 15:00	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 15:00	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 15:00	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 15:00	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 15:00	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 15:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*75 - 130*		*02/26/21 15:00*	*1*
4-Bromofluorobenzene (Surr)	*84*		*47 - 134*		*02/26/21 15:00*	*1*
Toluene-d8 (Surr)	*95*		*69 - 122*		*02/26/21 15:00*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*02/26/21 15:00*	*1*

Client Sample ID: MW-158S_021721
Lab Sample ID: 240-144656-2

Date Collected: 02/17/21 10:51
Matrix: Water
Date Received: 02/19/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 14:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/25/21 14:49*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 15:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 15:22	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 15:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 15:22	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 15:22	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 15:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*109*		*75 - 130*		*02/26/21 15:22*	*1*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*		*02/26/21 15:22*	*1*
Toluene-d8 (Surr)	*102*		*69 - 122*		*02/26/21 15:22*	*1*
Dibromofluoromethane (Surr)	*109*		*78 - 129*		*02/26/21 15:22*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-145139-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/12/2021 4:46:51 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at:
www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145139-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145139-1

Job ID: 240-145139-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-145139-1

Comments
No additional comments.

Receipt
The samples were received on 2/27/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.9º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145139-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145139-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-145139-1	TRIP BLANK	Water	02/25/21 00:00	02/27/21 08:00	
240-145139-2	MW-88S_022521	Water	02/25/21 12:22	02/27/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145139-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-145139-1

No Detections.

Client Sample ID: MW-88S_022521 — Lab Sample ID: 240-145139-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145139-1

Client Sample ID: TRIP BLANK
Date Collected: 02/25/21 00:00
Date Received: 02/27/21 08:00

Lab Sample ID: 240-145139-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 17:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 17:44	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 17:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 17:44	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 17:44	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 17:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*03/03/21 17:44*	*1*
4-Bromofluorobenzene (Surr)	*75*		*47 - 134*		*03/03/21 17:44*	*1*
Toluene-d8 (Surr)	*84*		*69 - 122*		*03/03/21 17:44*	*1*
Dibromofluoromethane (Surr)	*116*		*78 - 129*		*03/03/21 17:44*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145139-1

Client Sample ID: MW-88S_022521
Date Collected: 02/25/21 12:22
Date Received: 02/27/21 08:00

Lab Sample ID: 240-145139-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/04/21 15:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*70 - 133*		*03/04/21 15:11*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 18:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 18:06	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 18:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 18:06	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 18:06	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 18:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*03/03/21 18:06*	*1*
4-Bromofluorobenzene (Surr)	*75*		*47 - 134*		*03/03/21 18:06*	*1*
Toluene-d8 (Surr)	*87*		*69 - 122*		*03/03/21 18:06*	*1*
Dibromofluoromethane (Surr)	*115*		*78 - 129*		*03/03/21 18:06*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145139-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144838-B-2 MS	Matrix Spike	89	98	95	107
240-144838-B-2 MSD	Matrix Spike Duplicate	85	96	93	101
240-145139-1	TRIP BLANK	101	75	84	116
240-145139-2	MW-88S_022521	100	75	87	115
LCS 240-475239/4	Lab Control Sample	87	95	93	103
MB 240-475239/7	Method Blank	92	79	88	103

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-145136-J-2 MS	Matrix Spike	85
240-145136-J-2 MSD	Matrix Spike Duplicate	86
240-145139-2	MW-88S_022521	93
LCS 240-475458/4	Lab Control Sample	84
MB 240-475458/5	Method Blank	87

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475239/7
Matrix: Water
Analysis Batch: 475239

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 11:11	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 11:11	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 11:11	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 11:11	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 11:11	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 11:11	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*		*03/03/21 11:11*	*1*
4-Bromofluorobenzene (Surr)	*79*		*47 - 134*		*03/03/21 11:11*	*1*
Toluene-d8 (Surr)	*88*		*69 - 122*		*03/03/21 11:11*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*03/03/21 11:11*	*1*

Lab Sample ID: LCS 240-475239/4
Matrix: Water
Analysis Batch: 475239

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	12.8		ug/L		128	73 - 129
cis-1,2-Dichloroethene	10.0	11.1		ug/L		111	75 - 124
Tetrachloroethene	10.0	10.5		ug/L		105	70 - 125
trans-1,2-Dichloroethene	10.0	11.0		ug/L		110	74 - 130
Trichloroethene	10.0	10.2		ug/L		102	71 - 121
Vinyl chloride	10.0	11.0		ug/L		110	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*103*		*78 - 129*

Lab Sample ID: 240-144838-B-2 MS
Matrix: Water
Analysis Batch: 475239

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*75 - 130*
4-Bromofluorobenzene (Surr)	*98*		*47 - 134*
Toluene-d8 (Surr)	*95*		*69 - 122*
Dibromofluoromethane (Surr)	*107*		*78 - 129*

Lab Sample ID: 240-144838-B-2 MSD
Matrix: Water
Analysis Batch: 475239

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*75 - 130*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144838-B-2 MSD
Matrix: Water
Analysis Batch: 475239

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*101*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475458/5
Matrix: Water
Analysis Batch: 475458

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/04/21 11:50	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*87*		*70 - 133*		*03/04/21 11:50*	*1*

Lab Sample ID: LCS 240-475458/4
Matrix: Water
Analysis Batch: 475458

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	8.91		ug/L		89	80 - 135		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*

Lab Sample ID: 240-145136-J-2 MS
Matrix: Water
Analysis Batch: 475458

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	4.1		10.0	13.2		ug/L		91	46 - 170		

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*85*		*70 - 133*

Lab Sample ID: 240-145136-J-2 MSD
Matrix: Water
Analysis Batch: 475458

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	4.1		10.0	14.1		ug/L		100	46 - 170	6	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145139-1

GC/MS VOA

Analysis Batch: 475239

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-145139-1	TRIP BLANK	Total/NA	Water	8260B	
240-145139-2	MW-88S_022521	Total/NA	Water	8260B	
MB 240-475239/7	Method Blank	Total/NA	Water	8260B	
LCS 240-475239/4	Lab Control Sample	Total/NA	Water	8260B	
240-144838-B-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144838-B-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 475458

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-145139-2	MW-88S_022521	Total/NA	Water	8260B SIM	
MB 240-475458/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-475458/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-145136-J-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-145136-J-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145139-1

Client Sample ID: TRIP BLANK
Date Collected: 02/25/21 00:00
Date Received: 02/27/21 08:00

Lab Sample ID: 240-145139-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475239	03/03/21 17:44	LEE	TAL CAN

Client Sample ID: MW-88S_022521
Date Collected: 02/25/21 12:22
Date Received: 02/27/21 08:00

Lab Sample ID: 240-145139-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475239	03/03/21 18:06	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	475458	03/04/21 15:11	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145139-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Kristoffer Donahue	TAT if different from below: ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling:
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-885-022521	2/25/21	1222		G						G					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-145139 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Kristoffer Donahue	Arcadis	2/25/21 1710	Novi Cold Storage	Arcadis	2/25/21 1710
Julia McClafferty	Arcadis	2/26/21		GTA	2/26/21 0917
	GTA	2/26/21 0917	MJS ETA CANTON	FEB 27 2021	800

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3/12/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 240-145139**
Canton Facility

Client Arcadis Site Name

Cooler Received on FEB 27 2021 Opened on MAR 01 2021

Cooler unpacked by: MJS ETA CANTON

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam ~~Plastic Bag~~ None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.8 °C Corrected Cooler Temp. 1.9 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
   -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? Yes No
11. Sufficient quantity received to perform indicated analyses? Yes No
12. Are these work share samples and all listed on the COC? Yes No
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC907861
14. Were VOAs on the COC? Yes No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this. Yes No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # NA Yes No
17. Was a LL Hg or Me Hg trip blank present? Yes No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by: MJS ETA CANTON

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

March 13, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 145139-1
Sample date: 2021-02-25
Report received by CADENA: 2021-03-12
Initial Data Verification completed by CADENA: 2021-03-13
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

> The matrix spike/matrix spike duplicate (MS/MSD) analytes were not reported, because the analyte list for these samples did not match the analyte list for the MS/MSD parent sample.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 145139-1

		Sample Name:	TRIP BLANK				MW-88S_022521			
		Lab Sample ID:	2401451391				2401451392			
		Sample Date:	2/25/2021				2/25/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS Design & Consultancy for natural and built assets

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

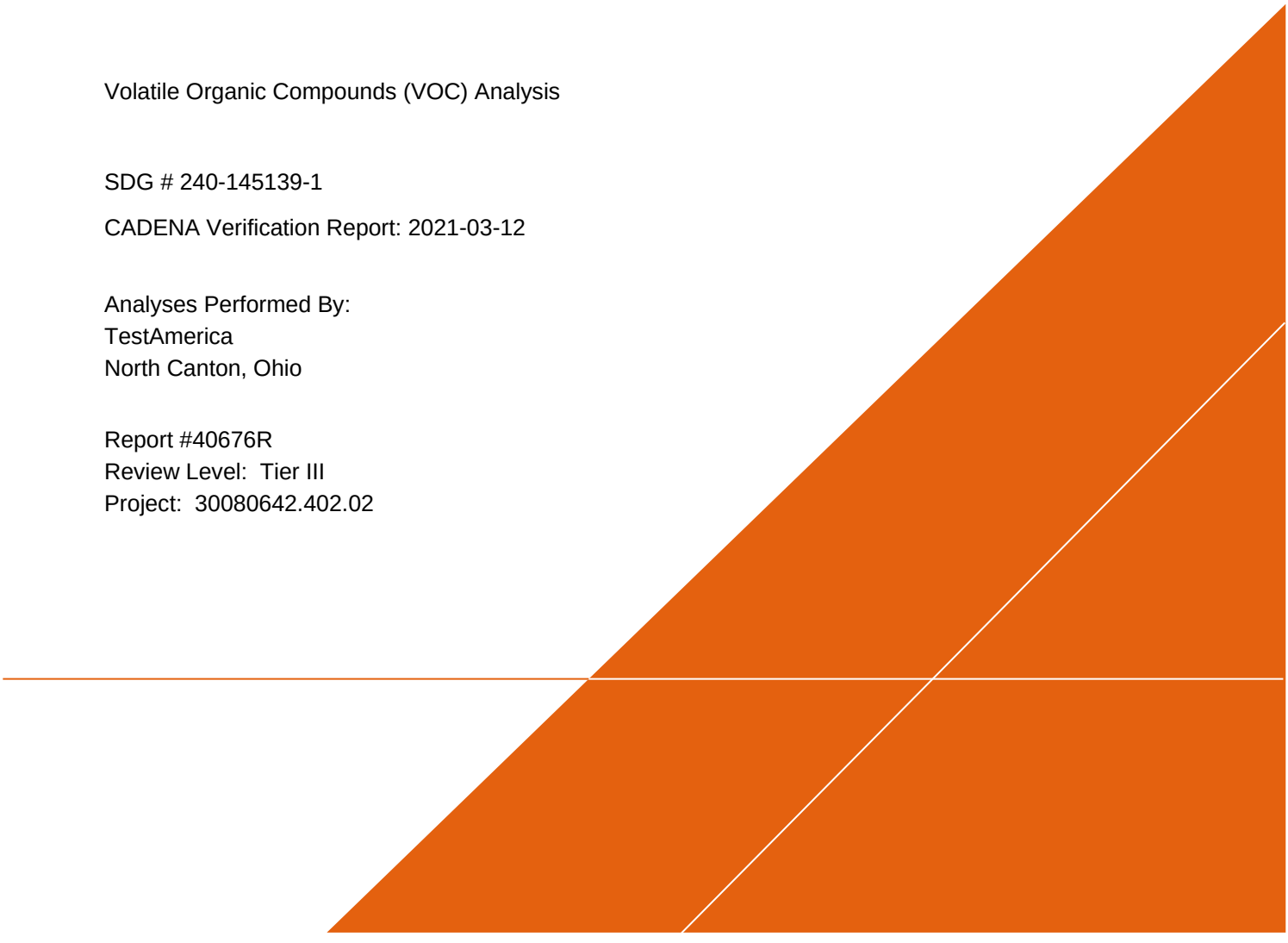
Volatile Organic Compounds (VOC) Analysis

SDG # 240-145139-1

CADENA Verification Report: 2021-03-12

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report #40676R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-145139-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					VOC
TRIP BLANK	240-145139-1	Water	02/25/2021		X
MW-88S_022521	240-145139-2	Water	02/25/2021		X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Prashanth K

SIGNATURE: 

DATE: March 26, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 29, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN
190

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Kristoffer Donahue	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day (10 day)		Walk-in client:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling:
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-885-022521	2/25/21	1222		Lo						Lo					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-145139 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time	Received by	Company	Date/Time
Relinquished by: Kristoffer Donahue	Arcadis	2/25/21 1710	Novi Cold Storage	Arcadis	2/25/21 1710
Relinquished by: Julia McClafferty	Arcadis	2/26/21		GTS	2/26/21 0934
Relinquished by:	GTA	2/26/21 0931	Received in Laboratory by: MJS ETA CANTON	Company: FEB 27 2021	Date/Time: 800

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03/12/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-145139-1
Date Collected: 02/25/21 00:00
Matrix: Water
Date Received: 02/27/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 17:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 17:44	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 17:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 17:44	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 17:44	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 17:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*03/03/21 17:44*	*1*
4-Bromofluorobenzene (Surr)	*75*		*47 - 134*		*03/03/21 17:44*	*1*
Toluene-d8 (Surr)	*84*		*69 - 122*		*03/03/21 17:44*	*1*
Dibromofluoromethane (Surr)	*116*		*78 - 129*		*03/03/21 17:44*	*1*

Client Sample ID: MW-88S_022521
Lab Sample ID: 240-145139-2
Date Collected: 02/25/21 12:22
Matrix: Water
Date Received: 02/27/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/04/21 15:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*93*		*70 - 133*		*03/04/21 15:11*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 18:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 18:06	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 18:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 18:06	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 18:06	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 18:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*03/03/21 18:06*	*1*
4-Bromofluorobenzene (Surr)	*75*		*47 - 134*		*03/03/21 18:06*	*1*
Toluene-d8 (Surr)	*87*		*69 - 122*		*03/03/21 18:06*	*1*
Dibromofluoromethane (Surr)	*115*		*78 - 129*		*03/03/21 18:06*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144913-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Jennifer Stiller

Authorized for release by:
3/18/2021 10:36:55 AM
Jennifer Stiller, Project Management Assistant II
Jennifer.Stiller@Eurofinset.com

Designee for

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144913-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144913-1

Job ID: 240-144913-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144913-1

Comments
No additional comments.

Receipt
The samples were received on 2/25/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.7º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144913-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144913-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144913-1	TRIP BLANK	Water	02/23/21 00:00	02/25/21 08:00	
240-144913-2	MW-126S_022321	Water	02/23/21 11:50	02/25/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144913-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144913-1

No Detections.

Client Sample ID: MW-126S_022321 — Lab Sample ID: 240-144913-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144913-1

Client Sample ID: TRIP BLANK
Date Collected: 02/23/21 00:00
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144913-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U H	1.0	0.19	ug/L			03/11/21 14:44	1
cis-1,2-Dichloroethene	1.0	U H	1.0	0.16	ug/L			03/11/21 14:44	1
Tetrachloroethene	1.0	U H	1.0	0.15	ug/L			03/11/21 14:44	1
trans-1,2-Dichloroethene	1.0	U H	1.0	0.19	ug/L			03/11/21 14:44	1
Trichloroethene	1.0	U H	1.0	0.10	ug/L			03/11/21 14:44	1
Vinyl chloride	1.0	U H	1.0	0.20	ug/L			03/11/21 14:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*		*03/11/21 14:44*	*1*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*		*03/11/21 14:44*	*1*
Toluene-d8 (Surr)	*96*		*69 - 122*		*03/11/21 14:44*	*1*
Dibromofluoromethane (Surr)	*88*		*78 - 129*		*03/11/21 14:44*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144913-1

Client Sample ID: MW-126S_022321
Date Collected: 02/23/21 11:50
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144913-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 17:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*70 - 133*		*03/02/21 17:24*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 17:14	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 17:14	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 17:14	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 17:14	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 17:14	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 17:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*75 - 130*		*03/02/21 17:14*	*1*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*		*03/02/21 17:14*	*1*
Toluene-d8 (Surr)	*100*		*69 - 122*		*03/02/21 17:14*	*1*
Dibromofluoromethane (Surr)	*105*		*78 - 129*		*03/02/21 17:14*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144913-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144718-C-13 MS	Matrix Spike	97	95	99	99
240-144718-C-13 MSD	Matrix Spike Duplicate	97	89	97	99
240-144913-1	TRIP BLANK	84	95	96	88
240-144913-2	MW-126S_022321	106	87	100	105
LCS 240-475001/4	Lab Control Sample	92	88	92	97
LCS 240-476417/4	Lab Control Sample	82	97	94	89
MB 240-475001/6	Method Blank	100	85	95	99
MB 240-476417/7	Method Blank	79	97	94	87

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144913-2	MW-126S_022321	92
240-145076-O-2 MS	Matrix Spike	94
240-145076-O-2 MSD	Matrix Spike Duplicate	91
LCS 240-475052/4	Lab Control Sample	88
MB 240-475052/5	Method Blank	87

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475001/6
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 11:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 11:19	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 11:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 11:19	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 11:19	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 11:19	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*03/02/21 11:19*	*1*
4-Bromofluorobenzene (Surr)	*85*		*47 - 134*		*03/02/21 11:19*	*1*
Toluene-d8 (Surr)	*95*		*69 - 122*		*03/02/21 11:19*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*03/02/21 11:19*	*1*

Lab Sample ID: LCS 240-475001/4
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.92		ug/L		89	73 - 129
cis-1,2-Dichloroethene	10.0	9.98		ug/L		100	75 - 124
Tetrachloroethene	10.0	9.61		ug/L		96	70 - 125
trans-1,2-Dichloroethene	10.0	9.73		ug/L		97	74 - 130
Trichloroethene	10.0	9.44		ug/L		94	71 - 121
Vinyl chloride	10.0	9.30		ug/L		93	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*
Toluene-d8 (Surr)	*92*		*69 - 122*
Dibromofluoromethane (Surr)	*97*		*78 - 129*

Lab Sample ID: 240-144718-C-13 MS
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25	U	250	217		ug/L		87	64 - 132
cis-1,2-Dichloroethene	25	U	250	230		ug/L		92	68 - 121
Tetrachloroethene	5.3	J	250	231		ug/L		90	52 - 129
trans-1,2-Dichloroethene	25	U	250	224		ug/L		90	69 - 126
Trichloroethene	510		250	655		ug/L		57	56 - 124
Vinyl chloride	25	U	250	208		ug/L		83	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*99*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144718-C-13 MS
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	99		78 - 129

Lab Sample ID: 240-144718-C-13 MSD
Matrix: Water
Analysis Batch: 475001

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	25	U	250	236		ug/L		94	64 - 132	8	35
cis-1,2-Dichloroethene	25	U	250	241		ug/L		97	68 - 121	5	35
Tetrachloroethene	5.3	J	250	251		ug/L		98	52 - 129	9	35
trans-1,2-Dichloroethene	25	U	250	236		ug/L		94	69 - 126	5	35
Trichloroethene	510		250	728		ug/L		86	56 - 124	11	35
Vinyl chloride	25	U	250	256		ug/L		103	49 - 136	21	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	97		75 - 130
4-Bromofluorobenzene (Surr)	89		47 - 134
Toluene-d8 (Surr)	97		69 - 122
Dibromofluoromethane (Surr)	99		78 - 129

Lab Sample ID: MB 240-476417/7
Matrix: Water
Analysis Batch: 476417

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/11/21 14:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/11/21 14:19	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/11/21 14:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/11/21 14:19	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/11/21 14:19	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/11/21 14:19	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	79		75 - 130		03/11/21 14:19	1
4-Bromofluorobenzene (Surr)	97		47 - 134		03/11/21 14:19	1
Toluene-d8 (Surr)	94		69 - 122		03/11/21 14:19	1
Dibromofluoromethane (Surr)	87		78 - 129		03/11/21 14:19	1

Lab Sample ID: LCS 240-476417/4
Matrix: Water
Analysis Batch: 476417

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.68		ug/L		87	73 - 129
cis-1,2-Dichloroethene	10.0	9.28		ug/L		93	75 - 124
Tetrachloroethene	10.0	9.89		ug/L		99	70 - 125
trans-1,2-Dichloroethene	10.0	9.06		ug/L		91	74 - 130
Trichloroethene	10.0	8.69		ug/L		87	71 - 121

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-476417/4
Matrix: Water
Analysis Batch: 476417

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Vinyl chloride			10.0	11.1		ug/L		111	61 - 134		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*75 - 130*
4-Bromofluorobenzene (Surr)	*97*		*47 - 134*
Toluene-d8 (Surr)	*94*		*69 - 122*
Dibromofluoromethane (Surr)	*89*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475052/5
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 12:26	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*70 - 133*		*03/02/21 12:26*	*1*

Lab Sample ID: LCS 240-475052/4
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	9.00		ug/L		90	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 133*

Lab Sample ID: 240-145076-O-2 MS
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	9.73		ug/L		97	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 133*

Lab Sample ID: 240-145076-O-2 MSD
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.82		ug/L		98	46 - 170	1	26

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-145076-O-2 MSD
Matrix: Water
Analysis Batch: 475052

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*91*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144913-1

GC/MS VOA

Analysis Batch: 475001

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144913-2	MW-126S_022321	Total/NA	Water	8260B	
MB 240-475001/6	Method Blank	Total/NA	Water	8260B	
LCS 240-475001/4	Lab Control Sample	Total/NA	Water	8260B	
240-144718-C-13 MS	Matrix Spike	Total/NA	Water	8260B	
240-144718-C-13 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 475052

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144913-2	MW-126S_022321	Total/NA	Water	8260B SIM	
MB 240-475052/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-475052/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-145076-O-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-145076-O-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 476417

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144913-1	TRIP BLANK	Total/NA	Water	8260B	
MB 240-476417/7	Method Blank	Total/NA	Water	8260B	
LCS 240-476417/4	Lab Control Sample	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144913-1

Client Sample ID: TRIP BLANK
Date Collected: 02/23/21 00:00
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144913-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	476417	03/11/21 14:44	LRW	TAL CAN

Client Sample ID: MW-126S_022321
Date Collected: 02/23/21 11:50
Date Received: 02/25/21 08:00

Lab Sample ID: 240-144913-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475001	03/02/21 17:14	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	475052	03/02/21 17:24	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144913-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

TestAmerica MICHIGAN 190

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No:
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below	of
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:	10 day (3 weeks, 2 weeks, 1 week, 2 days, 1 day)	For lab use only
Project Number: 30050315.402.04	Shipping/Tracking No:		Walk-in client
PO # 30050315.402.04			Lab sampling
			Job/SDG No:

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Acet / NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-1265 022321	2/23/21	1150		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-144913 Chain of Custody

Possible Hazard Identification: Non-Hazard, Flammable, Skin Irritant, Poison B, Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client, Disposal By Lab, Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company:	Date/Time:		Company:	Date/Time:
Relinquished by: Emma Witherspoon	Arcadis	2/23/21 1800	Received by: Novi Cold Storage	Arcadis	2/23/21 1800
Relinquished by: Mike McAfee	Arcadis	2/24/2021	Received by: Amanda Battershell	ETA	2/24/21 10:04
Relinquished by: Amanda Battershell	ETA	2/24/21 1404	Received in Laboratory by:	TA	2-25-21 800

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3/18/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 44913
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Ryan C

Cooler Received on 2-25-21 Opened on 2-25-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2.6 °C Corrected Cooler Temp. 2.7 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 59072 (Yes) No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT



March 18, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144913-1
Sample date: 2021-02-23
Report received by CADENA: 2021-03-18
Initial Data Verification completed by CADENA: 2021-03-18
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

HTQ - GCMS VOC sample TRIP BLANK analyses were performed outside of reference holding time so all associated results should be considered to be estimated and qualified with UJ flags if non-detect.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144913-1

		Sample Name:	TRIP BLANK				MW-126S_022321			
		Lab Sample ID:	2401449131				2401449132			
		Sample Date:	2/23/2021				2/23/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS Design & Consultancy for natural and built assets

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

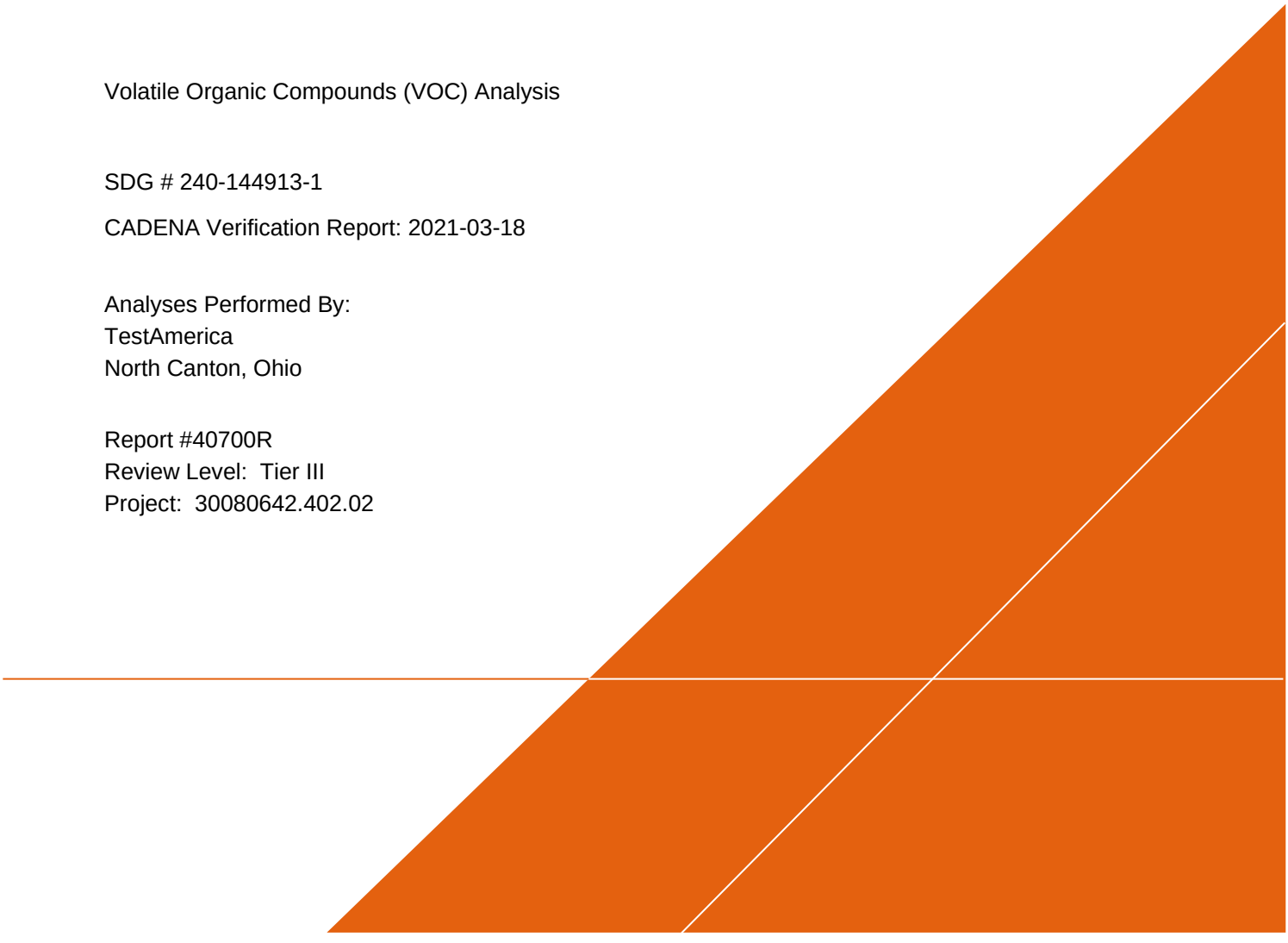
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144913-1

CADENA Verification Report: 2021-03-18

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report #40700R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144913-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					VOC
TRIP BLANK	240-144913-1	Water	02/23/2021		X
MW-126S_022321	240-144913-2	Water	02/23/2021		X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

The analyses that exceeded the holding are presented in the following table.

Sample ID	Holding Time	Criteria
TRIP BLANK	16 Days	14 days from collection to analysis

Sample results associated with sample locations analyzed by analytical method SW-846 8260B were qualified, as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

DATA REVIEW

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X	X		
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Prashanth K

SIGNATURE: 

DATE: March 26, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 29, 2021

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica MICHIGAN 190

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810129-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI. 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAcr/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 TRIP blank
MW-1265 022321	2/23/21	1150		6						6					N	G	X	X	X	X	X	X	X	3 vocs for 8260B 3 vocs for 8260B SIM

240-144913 Chain of Custody

Page 556 of 557

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by: Emma Witherspoon	Arcadis	2/23/21 1800	Novi Cold Storage	Arcadis	2/23/21 1800
Relinquished by: Julia McClafferty	Arcadis	2/24/2021	Received by: Amanda Battershell	Company: ETA	Date/Time: 2/24/21 10:04
Relinquished by: Amanda Battershell	Company: ETA	Date/Time: 2/24/21 1404	Received in Laboratory by:	Company: TA	Date/Time: 2-25-21 800

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Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144913-1

Date Collected: 02/23/21 00:00

Matrix: Water

Date Received: 02/25/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U H	1.0	0.19	ug/L			03/11/21 14:44	1
cis-1,2-Dichloroethene	1.0	U H	1.0	0.16	ug/L			03/11/21 14:44	1
Tetrachloroethene	1.0	U H	1.0	0.15	ug/L			03/11/21 14:44	1
trans-1,2-Dichloroethene	1.0	U H	1.0	0.19	ug/L			03/11/21 14:44	1
Trichloroethene	1.0	U H	1.0	0.10	ug/L			03/11/21 14:44	1
Vinyl chloride	1.0	U H	1.0	0.20	ug/L			03/11/21 14:44	1

UJ

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*		*03/11/21 14:44*	*1*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*		*03/11/21 14:44*	*1*
Toluene-d8 (Surr)	*96*		*69 - 122*		*03/11/21 14:44*	*1*
Dibromofluoromethane (Surr)	*88*		*78 - 129*		*03/11/21 14:44*	*1*

Client Sample ID: MW-126S_022321

Lab Sample ID: 240-144913-2

Date Collected: 02/23/21 11:50

Matrix: Water

Date Received: 02/25/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/02/21 17:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*70 - 133*		*03/02/21 17:24*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 17:14	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 17:14	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 17:14	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 17:14	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 17:14	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 17:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*75 - 130*		*03/02/21 17:14*	*1*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*		*03/02/21 17:14*	*1*
Toluene-d8 (Surr)	*100*		*69 - 122*		*03/02/21 17:14*	*1*
Dibromofluoromethane (Surr)	*105*		*78 - 129*		*03/02/21 17:14*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144812-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/10/2021 9:03:08 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at:
www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144812-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144812-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144812-1

Comments
No additional comments.

Receipt
The samples were received on 2/24/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.3° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144812-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144812-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144812-1	TRIP BLANK	Water	02/22/21 00:00	02/24/21 08:00	
240-144812-2	MW-109S_022221	Water	02/22/21 16:11	02/24/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144812-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144812-1

No Detections.

Client Sample ID: MW-109S_022221 — Lab Sample ID: 240-144812-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	0.35	J	1.0	0.20	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144812-1

Client Sample ID: TRIP BLANK

Date Collected: 02/22/21 00:00
Date Received: 02/24/21 08:00

Lab Sample ID: 240-144812-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 22:36	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 22:36	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 22:36	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 22:36	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 22:36	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 22:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*75 - 130*		*03/01/21 22:36*	*1*
4-Bromofluorobenzene (Surr)	*64*		*47 - 134*		*03/01/21 22:36*	*1*
Toluene-d8 (Surr)	*79*		*69 - 122*		*03/01/21 22:36*	*1*
Dibromofluoromethane (Surr)	*118*		*78 - 129*		*03/01/21 22:36*	*1*

Client Sample ID: MW-109S_022221

Date Collected: 02/22/21 16:11
Date Received: 02/24/21 08:00

Lab Sample ID: 240-144812-2

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 16:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*70 - 133*		*03/01/21 16:49*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 21:25	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 21:25	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 21:25	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 21:25	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 21:25	1
Vinyl chloride	**0.35**	**J**	1.0	0.20	ug/L			03/01/21 21:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*113*		*75 - 130*		*03/01/21 21:25*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*03/01/21 21:25*	*1*
Toluene-d8 (Surr)	*81*		*69 - 122*		*03/01/21 21:25*	*1*
Dibromofluoromethane (Surr)	*111*		*78 - 129*		*03/01/21 21:25*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144812-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144807-G-4 MS	Matrix Spike	92	91	89	96
240-144807-H-4 MSD	Matrix Spike Duplicate	86	91	88	90
240-144812-1	TRIP BLANK	116	64	79	118
240-144812-2	MW-109S_022221	113	65	81	111
LCS 240-474892/4	Lab Control Sample	88	89	89	89
MB 240-474892/7	Method Blank	104	70	82	110

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144807-J-4 MS	Matrix Spike	90
240-144807-J-4 MSD	Matrix Spike Duplicate	88
240-144812-2	MW-109S_022221	91
LCS 240-474842/4	Lab Control Sample	90
MB 240-474842/5	Method Blank	86

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474892/7
Matrix: Water
Analysis Batch: 474892

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 15:51	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 15:51	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 15:51	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 15:51	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 15:51	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 15:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*03/01/21 15:51*	*1*
4-Bromofluorobenzene (Surr)	*70*		*47 - 134*		*03/01/21 15:51*	*1*
Toluene-d8 (Surr)	*82*		*69 - 122*		*03/01/21 15:51*	*1*
Dibromofluoromethane (Surr)	*110*		*78 - 129*		*03/01/21 15:51*	*1*

Lab Sample ID: LCS 240-474892/4
Matrix: Water
Analysis Batch: 474892

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.84		ug/L		98	73 - 129
cis-1,2-Dichloroethene	10.0	9.22		ug/L		92	75 - 124
Tetrachloroethene	10.0	10.9		ug/L		109	70 - 125
trans-1,2-Dichloroethene	10.0	9.78		ug/L		98	74 - 130
Trichloroethene	10.0	9.30		ug/L		93	71 - 121
Vinyl chloride	10.0	9.80		ug/L		98	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 130*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*
Toluene-d8 (Surr)	*89*		*69 - 122*
Dibromofluoromethane (Surr)	*89*		*78 - 129*

Lab Sample ID: 240-144807-G-4 MS
Matrix: Water
Analysis Batch: 474892

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.25		ug/L		93	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	9.38		ug/L		94	68 - 121
Tetrachloroethene	1.0	U	10.0	11.7		ug/L		117	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.98		ug/L		100	69 - 126
Trichloroethene	1.0	U	10.0	9.60		ug/L		96	56 - 124
Vinyl chloride	1.0	U	10.0	10.4		ug/L		104	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*
Toluene-d8 (Surr)	*89*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144807-G-4 MS
Matrix: Water
Analysis Batch: 474892

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	96		78 - 129

Lab Sample ID: 240-144807-H-4 MSD
Matrix: Water
Analysis Batch: 474892

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.00		ug/L		90	64 - 132	3	35
cis-1,2-Dichloroethene	1.0	U	10.0	8.99		ug/L		90	68 - 121	4	35
Tetrachloroethene	1.0	U	10.0	11.0		ug/L		110	52 - 129	6	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.43		ug/L		94	69 - 126	6	35
Trichloroethene	1.0	U	10.0	9.01		ug/L		90	56 - 124	6	35
Vinyl chloride	1.0	U	10.0	10.1		ug/L		101	49 - 136	3	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	86		75 - 130
4-Bromofluorobenzene (Surr)	91		47 - 134
Toluene-d8 (Surr)	88		69 - 122
Dibromofluoromethane (Surr)	90		78 - 129

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474842/5
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 12:12	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	86		70 - 133		03/01/21 12:12	1

Lab Sample ID: LCS 240-474842/4
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.05		ug/L		91	80 - 135

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	90		70 - 133

Lab Sample ID: 240-144807-J-4 MS
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	8.95		ug/L		90	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*90*		*70 - 133*

Lab Sample ID: 240-144807-J-4 MSD
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.28		ug/L		93	46 - 170	4	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144812-1

GC/MS VOA

Analysis Batch: 474842

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144812-2	MW-109S_022221	Total/NA	Water	8260B SIM	
MB 240-474842/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474842/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144807-J-4 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144807-J-4 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474892

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144812-1	TRIP BLANK	Total/NA	Water	8260B	
240-144812-2	MW-109S_022221	Total/NA	Water	8260B	
MB 240-474892/7	Method Blank	Total/NA	Water	8260B	
LCS 240-474892/4	Lab Control Sample	Total/NA	Water	8260B	
240-144807-G-4 MS	Matrix Spike	Total/NA	Water	8260B	
240-144807-H-4 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144812-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144812-1

Date Collected: 02/22/21 00:00

Matrix: Water

Date Received: 02/24/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474892	03/01/21 22:36	LRW	TAL CAN

Client Sample ID: MW-109S_022221

Lab Sample ID: 240-144812-2

Date Collected: 02/22/21 16:11

Matrix: Water

Date Received: 02/24/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474892	03/01/21 21:25	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474842	03/01/21 16:49	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144812-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

1-21.3

Chain of Custody Record

MICHIGAN TestAmerica 190

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Gary Schafer	TAT if different from below		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:	10 day — 3 weeks / 2 weeks / 1 week / 2 days / 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/22/21			X						1							X	X	X	X	X	X	X	Trip blank
MW-109S-022221	02/22/21	16:11		X						6					N	G	X	X	X	X	X	X	X	Method 8260B " 8260 RSim

240-144812 Chain of Custody

Possible Hazard Identification: Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / Disposal By Lab / Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: Gary Schafer	Arcadis	02/22/21 1731	Received by: NDU Cold Storage	Arcadis	02/22/21 1731
Relinquished by: Julia McClafferty	Arcadis	2/23/2021	Received by: Amanda Battenhell	ETA	2/23/21 10:04
Relinquished by: Amanda Battenhell	ETA	2/23/21 10:47	Received in Laboratory by:	TA	2-24-21 800

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3/10/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative Login # : 144812
Canton Facility

Client Arcadis Site Name

Cooler Received on 2-24-21 Opened on 2-24-21

Cooler unpacked by:

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1-2 °C Corrected Cooler Temp. 1-3 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 — Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? — Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? — Yes No
   -Were tamper/custody seals intact and uncompromised? — Yes No NA
3. Shippers' packing slip attached to the cooler(s)? — Yes No
4. Did custody papers accompany the sample(s)? — Yes No
5. Were the custody papers relinquished & signed in the appropriate place? — Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? — Yes No
7. Did all bottles arrive in good condition (Unbroken)? — Yes No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? — Yes No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? — Yes No
11. Sufficient quantity received to perform indicated analyses? — Yes No
12. Are these work share samples and all listed on the COC? — Yes No
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? — Yes No NA pH Strip Lot# HC907861
14. Were VOAs on the COC? — Yes No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. — Yes No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # — Yes No
17. Was a LL Hg or Me Hg trip blank present? — Yes No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container.
Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.
Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

DATA VERIFICATION REPORT

March 10, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144812-1
Sample date: 2021-02-22
Report received by CADENA: 2021-03-10
Initial Data Verification completed by CADENA: 2021-03-10
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144812-1

		Sample Name:	TRIP BLANK				MW-109S_022221			
		Lab Sample ID:	2401448121				2401448122			
		Sample Date:	2/22/2021				2/22/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	0.35	1.0	ug/l	J
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

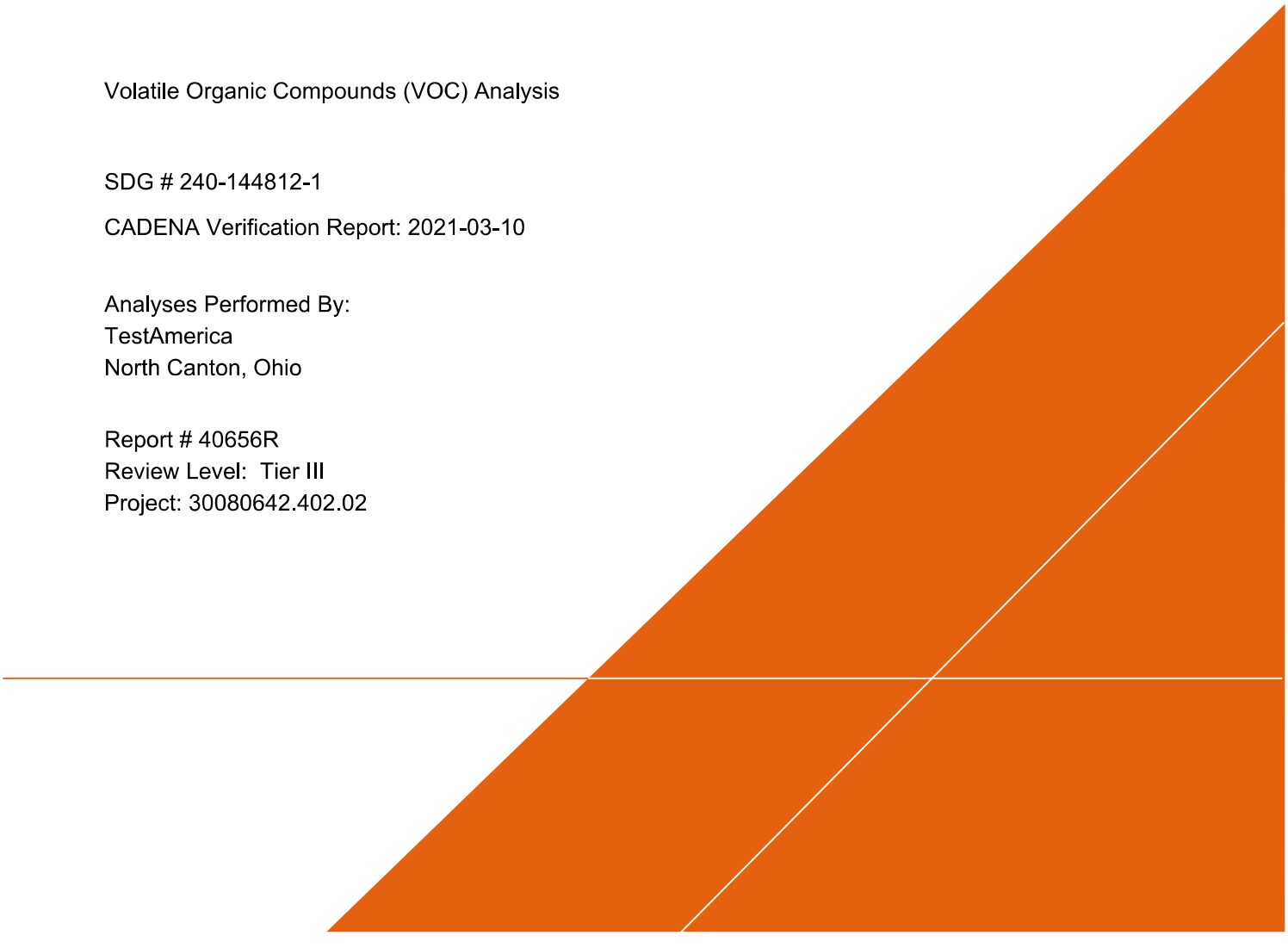
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144812-1

CADENA Verification Report: 2021-03-10

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40656R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144812-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144812-1	Water	02/22/2021		X	
MW-109S_022221	240-144812-2	Water	02/22/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial/Continuing	Compound	Criteria
TRIP BLANK MW-109S_022221	CCV %D	Tetrachloroethene	+21.9%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J

Initial/Continuing	Criteria	Sample Result	Qualification
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1] RRF of 0.01 only applies to compounds which are typically poor responding compounds (i.e., ketones, 1,4-dioxane, etc.)

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 22, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 24, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

1-21.3

Chain of Custody Record

MICHIGAN TestAmerica

190

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Gary Schafer	TAT if different from below		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:	10 day — 3 weeks / 2 weeks / 1 week / 2 days / 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/22/21			X						1							X	X	X	X	X	X	X	Trip blank
MW-1095-022221	02/22/21	16:11		X						6					N	G	X	X	X	X	X	X	X	Method 8260B 8260B SIM

240-144812 Chain of Custody

Possible Hazard Identification: Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / Disposal By Lab / Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	02/22/21 1731	NOVI Cold Storage	Arcadis	02/22/21 1731
Julia McClafferty	Arcadis	2/23/2021	Miranda Battenhell	ETA	2/23/21 10:04
Miranda Battenhell	ETA	2/23/21 10:47	Received in Laboratory by:	Company: TA	Date/Time: 2-24-21 800

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03/10/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144812-1

Date Collected: 02/22/21 00:00
Matrix: Water
Date Received: 02/24/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 22:36	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 22:36	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 22:36	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 22:36	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 22:36	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 22:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*75 - 130*		*03/01/21 22:36*	*1*
4-Bromofluorobenzene (Surr)	*64*		*47 - 134*		*03/01/21 22:36*	*1*
Toluene-d8 (Surr)	*79*		*69 - 122*		*03/01/21 22:36*	*1*
Dibromofluoromethane (Surr)	*118*		*78 - 129*		*03/01/21 22:36*	*1*

Client Sample ID: MW-109S_022221
Lab Sample ID: 240-144812-2

Date Collected: 02/22/21 16:11
Matrix: Water
Date Received: 02/24/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 16:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*70 - 133*		*03/01/21 16:49*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 21:25	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 21:25	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 21:25	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 21:25	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 21:25	1
Vinyl chloride	**0.35**	**J**	1.0	0.20	ug/L			03/01/21 21:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*113*		*75 - 130*		*03/01/21 21:25*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*03/01/21 21:25*	*1*
Toluene-d8 (Surr)	*81*		*69 - 122*		*03/01/21 21:25*	*1*
Dibromofluoromethane (Surr)	*111*		*78 - 129*		*03/01/21 21:25*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-145137-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/12/2021 4:45:27 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145137-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145137-1

Job ID: 240-145137-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-145137-1

Comments
No additional comments.

Receipt
The samples were received on 2/27/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.9º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145137-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145137-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-145137-1	TRIP BLANK	Water	02/25/21 00:00	02/27/21 08:00	
240-145137-2	MW-181S_022521	Water	02/25/21 10:24	02/27/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145137-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-145137-1

No Detections.

Client Sample ID: MW-181S_022521 — Lab Sample ID: 240-145137-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145137-1

Client Sample ID: TRIP BLANK
Date Collected: 02/25/21 00:00
Date Received: 02/27/21 08:00

Lab Sample ID: 240-145137-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 16:17	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 16:17	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 16:17	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 16:17	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 16:17	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 16:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*		*03/03/21 16:17*	*1*
4-Bromofluorobenzene (Surr)	*78*		*47 - 134*		*03/03/21 16:17*	*1*
Toluene-d8 (Surr)	*85*		*69 - 122*		*03/03/21 16:17*	*1*
Dibromofluoromethane (Surr)	*112*		*78 - 129*		*03/03/21 16:17*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145137-1

Client Sample ID: MW-181S_022521
Date Collected: 02/25/21 10:24
Date Received: 02/27/21 08:00

Lab Sample ID: 240-145137-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/04/21 14:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*03/04/21 14:21*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 16:39	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 16:39	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 16:39	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 16:39	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 16:39	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 16:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 130*		*03/03/21 16:39*	*1*
4-Bromofluorobenzene (Surr)	*75*		*47 - 134*		*03/03/21 16:39*	*1*
Toluene-d8 (Surr)	*85*		*69 - 122*		*03/03/21 16:39*	*1*
Dibromofluoromethane (Surr)	*115*		*78 - 129*		*03/03/21 16:39*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145137-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144838-B-2 MS	Matrix Spike	89	98	95	107
240-144838-B-2 MSD	Matrix Spike Duplicate	85	96	93	101
240-145137-1	TRIP BLANK	97	78	85	112
240-145137-2	MW-181S_022521	98	75	85	115
LCS 240-475239/4	Lab Control Sample	87	95	93	103
MB 240-475239/7	Method Blank	92	79	88	103

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-145136-J-2 MS	Matrix Spike	85
240-145136-J-2 MSD	Matrix Spike Duplicate	86
240-145137-2	MW-181S_022521	80
LCS 240-475458/4	Lab Control Sample	84
MB 240-475458/5	Method Blank	87

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475239/7
Matrix: Water
Analysis Batch: 475239

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 11:11	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 11:11	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 11:11	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 11:11	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 11:11	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 11:11	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*		*03/03/21 11:11*	*1*
4-Bromofluorobenzene (Surr)	*79*		*47 - 134*		*03/03/21 11:11*	*1*
Toluene-d8 (Surr)	*88*		*69 - 122*		*03/03/21 11:11*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*03/03/21 11:11*	*1*

Lab Sample ID: LCS 240-475239/4
Matrix: Water
Analysis Batch: 475239

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	12.8		ug/L		128	73 - 129
cis-1,2-Dichloroethene	10.0	11.1		ug/L		111	75 - 124
Tetrachloroethene	10.0	10.5		ug/L		105	70 - 125
trans-1,2-Dichloroethene	10.0	11.0		ug/L		110	74 - 130
Trichloroethene	10.0	10.2		ug/L		102	71 - 121
Vinyl chloride	10.0	11.0		ug/L		110	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*103*		*78 - 129*

Lab Sample ID: 240-144838-B-2 MS
Matrix: Water
Analysis Batch: 475239

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*75 - 130*
4-Bromofluorobenzene (Surr)	*98*		*47 - 134*
Toluene-d8 (Surr)	*95*		*69 - 122*
Dibromofluoromethane (Surr)	*107*		*78 - 129*

Lab Sample ID: 240-144838-B-2 MSD
Matrix: Water
Analysis Batch: 475239

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*75 - 130*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144838-B-2 MSD
Matrix: Water
Analysis Batch: 475239

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*101*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475458/5
Matrix: Water
Analysis Batch: 475458

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/04/21 11:50	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*87*		*70 - 133*		*03/04/21 11:50*	*1*

Lab Sample ID: LCS 240-475458/4
Matrix: Water
Analysis Batch: 475458

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	8.91		ug/L		89	80 - 135		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*

Lab Sample ID: 240-145136-J-2 MS
Matrix: Water
Analysis Batch: 475458

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	4.1		10.0	13.2		ug/L		91	46 - 170		

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*85*		*70 - 133*

Lab Sample ID: 240-145136-J-2 MSD
Matrix: Water
Analysis Batch: 475458

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	4.1		10.0	14.1		ug/L		100	46 - 170	6	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145137-1

GC/MS VOA

Analysis Batch: 475239

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-145137-1	TRIP BLANK	Total/NA	Water	8260B	
240-145137-2	MW-181S_022521	Total/NA	Water	8260B	
MB 240-475239/7	Method Blank	Total/NA	Water	8260B	
LCS 240-475239/4	Lab Control Sample	Total/NA	Water	8260B	
240-144838-B-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144838-B-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 475458

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-145137-2	MW-181S_022521	Total/NA	Water	8260B SIM	
MB 240-475458/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-475458/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-145136-J-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-145136-J-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145137-1

Client Sample ID: TRIP BLANK
Date Collected: 02/25/21 00:00
Date Received: 02/27/21 08:00

Lab Sample ID: 240-145137-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475239	03/03/21 16:17	LEE	TAL CAN

Client Sample ID: MW-181S_022521
Date Collected: 02/25/21 10:24
Date Received: 02/27/21 08:00

Lab Sample ID: 240-145137-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475239	03/03/21 16:39	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	475458	03/04/21 14:21	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145137-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name:	TAT if different from below: ☐ 3 weeks ☐ 10 day ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client: Lab sampling:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-181S_022521	2/25/21	1024		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-145137 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company: Arcadis	Date/Time: 2/25/21 1710	Received by: Novi Cold Storage	Company: Arcadis	Date/Time: 2/25/21 1710
Relinquished by:	Company: Arcadis	Date/Time: 2/26/2021	Received by:	Company: GTI	Date/Time: 2/26/21 0932
Relinquished by:	Company: ETA	Date/Time: 2/26/21 0932	Received in Laboratory by:	Company:	Date/Time:

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3/12/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 240-145137**
Canton Facility

Client Arcadis Site Name

Cooler Received on FEB 27 2021 Opened on MAR 01 2021

Cooler unpacked by: MJS ETA CANTON

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam ~~Plastic Bag~~ None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.8 °C Corrected Cooler Temp. 1.9 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
   -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? Yes No
11. Sufficient quantity received to perform indicated analyses? Yes No
12. Are these work share samples and all listed on the COC? Yes No
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC907861
14. Were VOAs on the COC? Yes No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # NA Yes No
17. Was a LL Hg or Me Hg trip blank present? ____ Yes No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by MJS ETA CANTON

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT



March 12, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 145137-1
Sample date: 2021-02-25
Report received by CADENA: 2021-03-12
Initial Data Verification completed by CADENA: 2021-03-12
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

> The matrix spike/matrix spike duplicate (MS/MSD) analytes were not reported, because the analyte list for these samples did not match the analyte list for the MS/MSD parent sample.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 145137-1

		Sample Name:	TRIP BLANK				MW-181S_022521			
		Lab Sample ID:	2401451371				2401451372			
		Sample Date:	2/25/2021				2/25/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS Design & Consultancy for natural and built assets

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

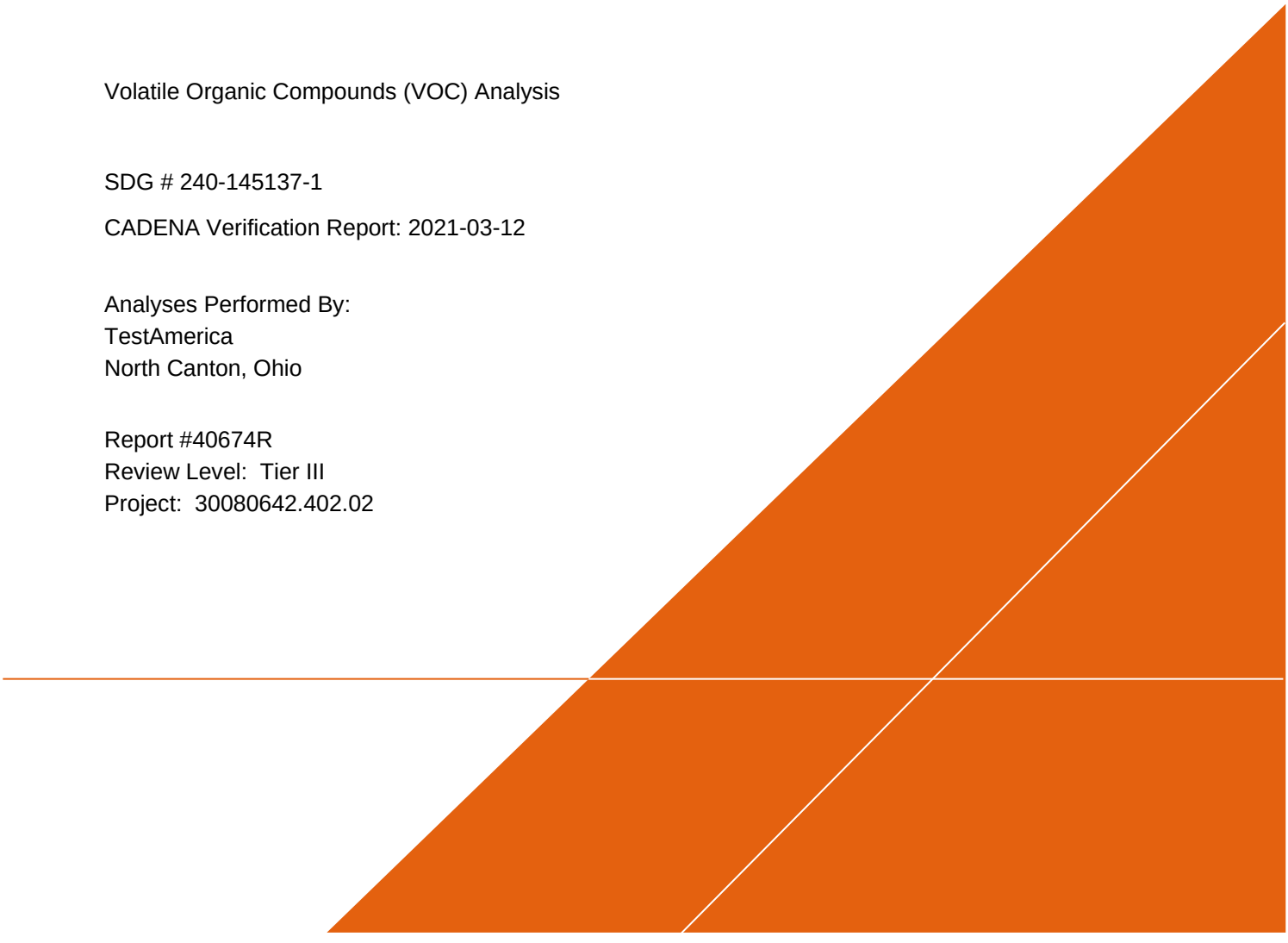
Volatile Organic Compounds (VOC) Analysis

SDG # 240-145137-1

CADENA Verification Report: 2021-03-12

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report #40674R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-145137-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					VOC
TRIP BLANK	240-145137-1	Water	02/25/2021		X
MW-181S_022521	240-145137-2	Water	02/25/2021		X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Prashanth K

SIGNATURE: 

DATE: March 25, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 29, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

MICHIGAN 190

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name:	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:	10 day		Lab sampling:
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-181S_022521	2/25/21	1024		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-145137 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com, Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Arcadis	2/25/21 1710	Novi Cold Storage	Arcadis	2/25/21 1710
	Arcadis	2/26/2021		GTA	2/20/21 0914
	GTA	2/20/21 0914	Received in Laboratory by:	Company:	Date/Time:

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03/12/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-145137-1

Date Collected: 02/25/21 00:00
Matrix: Water
Date Received: 02/27/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 16:17	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 16:17	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 16:17	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 16:17	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 16:17	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 16:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*		*03/03/21 16:17*	*1*
4-Bromofluorobenzene (Surr)	*78*		*47 - 134*		*03/03/21 16:17*	*1*
Toluene-d8 (Surr)	*85*		*69 - 122*		*03/03/21 16:17*	*1*
Dibromofluoromethane (Surr)	*112*		*78 - 129*		*03/03/21 16:17*	*1*

Client Sample ID: MW-181S_022521
Lab Sample ID: 240-145137-2

Date Collected: 02/25/21 10:24
Matrix: Water
Date Received: 02/27/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/04/21 14:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*03/04/21 14:21*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 16:39	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 16:39	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 16:39	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 16:39	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 16:39	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 16:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 130*		*03/03/21 16:39*	*1*
4-Bromofluorobenzene (Surr)	*75*		*47 - 134*		*03/03/21 16:39*	*1*
Toluene-d8 (Surr)	*85*		*69 - 122*		*03/03/21 16:39*	*1*
Dibromofluoromethane (Surr)	*115*		*78 - 129*		*03/03/21 16:39*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144813-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/10/2021 9:10:14 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144813-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144813-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144813-1

Comments
No additional comments.

Receipt
The samples were received on 2/24/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.3° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144813-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144813-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144813-1	TRIP BLANK	Water	02/22/21 00:00	02/24/21 08:00	
240-144813-2	MW-170S_022221	Water	02/22/21 13:56	02/24/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144813-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144813-1

No Detections.

Client Sample ID: MW-170S_022221 — Lab Sample ID: 240-144813-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144813-1

Client Sample ID: TRIP BLANK

Date Collected: 02/22/21 00:00
Date Received: 02/24/21 08:00

Lab Sample ID: 240-144813-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 00:12	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 00:12	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 00:12	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 00:12	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 00:12	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 00:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*75 - 130*		*03/02/21 00:12*	*1*
4-Bromofluorobenzene (Surr)	*75*		*47 - 134*		*03/02/21 00:12*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*03/02/21 00:12*	*1*
Dibromofluoromethane (Surr)	*113*		*78 - 129*		*03/02/21 00:12*	*1*

Client Sample ID: MW-170S_022221
Date Collected: 02/22/21 13:56
Date Received: 02/24/21 08:00

Lab Sample ID: 240-144813-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 17:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*70 - 133*		*03/01/21 17:14*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 21:49	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 21:49	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 21:49	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 21:49	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 21:49	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 21:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*75 - 130*		*03/01/21 21:49*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*03/01/21 21:49*	*1*
Toluene-d8 (Surr)	*79*		*69 - 122*		*03/01/21 21:49*	*1*
Dibromofluoromethane (Surr)	*109*		*78 - 129*		*03/01/21 21:49*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144813-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144807-G-4 MS	Matrix Spike	92	91	89	96
240-144807-H-4 MSD	Matrix Spike Duplicate	86	91	88	90
240-144813-1	TRIP BLANK	117	75	80	113
240-144813-2	MW-170S_022221	116	65	79	109
LCS 240-474892/4	Lab Control Sample	88	89	89	89
MB 240-474892/7	Method Blank	104	70	82	110

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144807-J-4 MS	Matrix Spike	90
240-144807-J-4 MSD	Matrix Spike Duplicate	88
240-144813-2	MW-170S_022221	89
LCS 240-474842/4	Lab Control Sample	90
MB 240-474842/5	Method Blank	86

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474892/7
Matrix: Water
Analysis Batch: 474892

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 15:51	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 15:51	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 15:51	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 15:51	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 15:51	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 15:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*03/01/21 15:51*	*1*
4-Bromofluorobenzene (Surr)	*70*		*47 - 134*		*03/01/21 15:51*	*1*
Toluene-d8 (Surr)	*82*		*69 - 122*		*03/01/21 15:51*	*1*
Dibromofluoromethane (Surr)	*110*		*78 - 129*		*03/01/21 15:51*	*1*

Lab Sample ID: LCS 240-474892/4
Matrix: Water
Analysis Batch: 474892

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.84		ug/L		98	73 - 129
cis-1,2-Dichloroethene	10.0	9.22		ug/L		92	75 - 124
Tetrachloroethene	10.0	10.9		ug/L		109	70 - 125
trans-1,2-Dichloroethene	10.0	9.78		ug/L		98	74 - 130
Trichloroethene	10.0	9.30		ug/L		93	71 - 121
Vinyl chloride	10.0	9.80		ug/L		98	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 130*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*
Toluene-d8 (Surr)	*89*		*69 - 122*
Dibromofluoromethane (Surr)	*89*		*78 - 129*

Lab Sample ID: 240-144807-G-4 MS
Matrix: Water
Analysis Batch: 474892

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.25		ug/L		93	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	9.38		ug/L		94	68 - 121
Tetrachloroethene	1.0	U	10.0	11.7		ug/L		117	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.98		ug/L		100	69 - 126
Trichloroethene	1.0	U	10.0	9.60		ug/L		96	56 - 124
Vinyl chloride	1.0	U	10.0	10.4		ug/L		104	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*
Toluene-d8 (Surr)	*89*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144807-G-4 MS
Matrix: Water
Analysis Batch: 474892

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*96*		*78 - 129*

Lab Sample ID: 240-144807-H-4 MSD
Matrix: Water
Analysis Batch: 474892

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.00		ug/L		90	64 - 132	3	35
cis-1,2-Dichloroethene	1.0	U	10.0	8.99		ug/L		90	68 - 121	4	35
Tetrachloroethene	1.0	U	10.0	11.0		ug/L		110	52 - 129	6	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.43		ug/L		94	69 - 126	6	35
Trichloroethene	1.0	U	10.0	9.01		ug/L		90	56 - 124	6	35
Vinyl chloride	1.0	U	10.0	10.1		ug/L		101	49 - 136	3	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*
Toluene-d8 (Surr)	*88*		*69 - 122*
Dibromofluoromethane (Surr)	*90*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474842/5
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 12:12	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*		*03/01/21 12:12*	*1*

Lab Sample ID: LCS 240-474842/4
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.05		ug/L		91	80 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*70 - 133*

Lab Sample ID: 240-144807-J-4 MS
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	8.95		ug/L		90	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*90*		*70 - 133*

Lab Sample ID: 240-144807-J-4 MSD
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.28		ug/L		93	46 - 170	4	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 133*

GC/MS VOA

Analysis Batch: 474842

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144813-2	MW-170S_022221	Total/NA	Water	8260B SIM	
MB 240-474842/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474842/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144807-J-4 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144807-J-4 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474892

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144813-1	TRIP BLANK	Total/NA	Water	8260B	
240-144813-2	MW-170S_022221	Total/NA	Water	8260B	
MB 240-474892/7	Method Blank	Total/NA	Water	8260B	
LCS 240-474892/4	Lab Control Sample	Total/NA	Water	8260B	
240-144807-G-4 MS	Matrix Spike	Total/NA	Water	8260B	
240-144807-H-4 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144813-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144813-1

Date Collected: 02/22/21 00:00

Matrix: Water

Date Received: 02/24/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474892	03/02/21 00:12	LRW	TAL CAN

Client Sample ID: MW-170S_022221

Lab Sample ID: 240-144813-2

Date Collected: 02/22/21 13:56

Matrix: Water

Date Received: 02/24/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474892	03/01/21 21:49	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474842	03/01/21 17:14	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144813-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

1.2/1.3

Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190 TestAmerica

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No: / of / COCs
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day	For lab use only: Walk-in client; Lab sampling; Job/SDG No:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: HZSO4	HNO3	HCl	NaOH	Zn Ac/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/22/21			X						1							X	X	X	X	X	X	X	1 trip blank
MW-1705-022221	02/22/21	13:56 13:36 Jm 2/23/21		X						6					N	G	X	X	X	X	X	X	X	Method 8260B Method 8260B SIM

240-144813 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	02/22/21 1732	Novi cold storage	Arcadis	02/22/21 1732
Julia McClafferty	Arcadis	2/23/2021	Amanda Battershell	ETA	2/23/21 10:04
Amanda Battershell	ETA	2/23/21 10:47	Received in Laboratory by:		Date/Time: 2-24-21 800

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3/10/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative Login # : 144817
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by:

Cooler Received on 2-24-21 Opened on 2-24-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1-2 °C Corrected Cooler Temp. 1-3 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC907861
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

_____

_____

_____

_____

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

March 10, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144813-1
Sample date: 2021-02-22
Report received by CADENA: 2021-03-10
Initial Data Verification completed by CADENA: 2021-03-10
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144813-1

		Sample Name:	TRIP BLANK				MW-170S_022221			
		Lab Sample ID:	2401448131				2401448132			
		Sample Date:	2/22/2021				2/22/2021			
Analyte	**Cas No.**	**Result**	**Report Limit**	**Units**	**Valid Qualifier**	**Result**	**Report Limit**	**Units**	**Valid Qualifier**
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

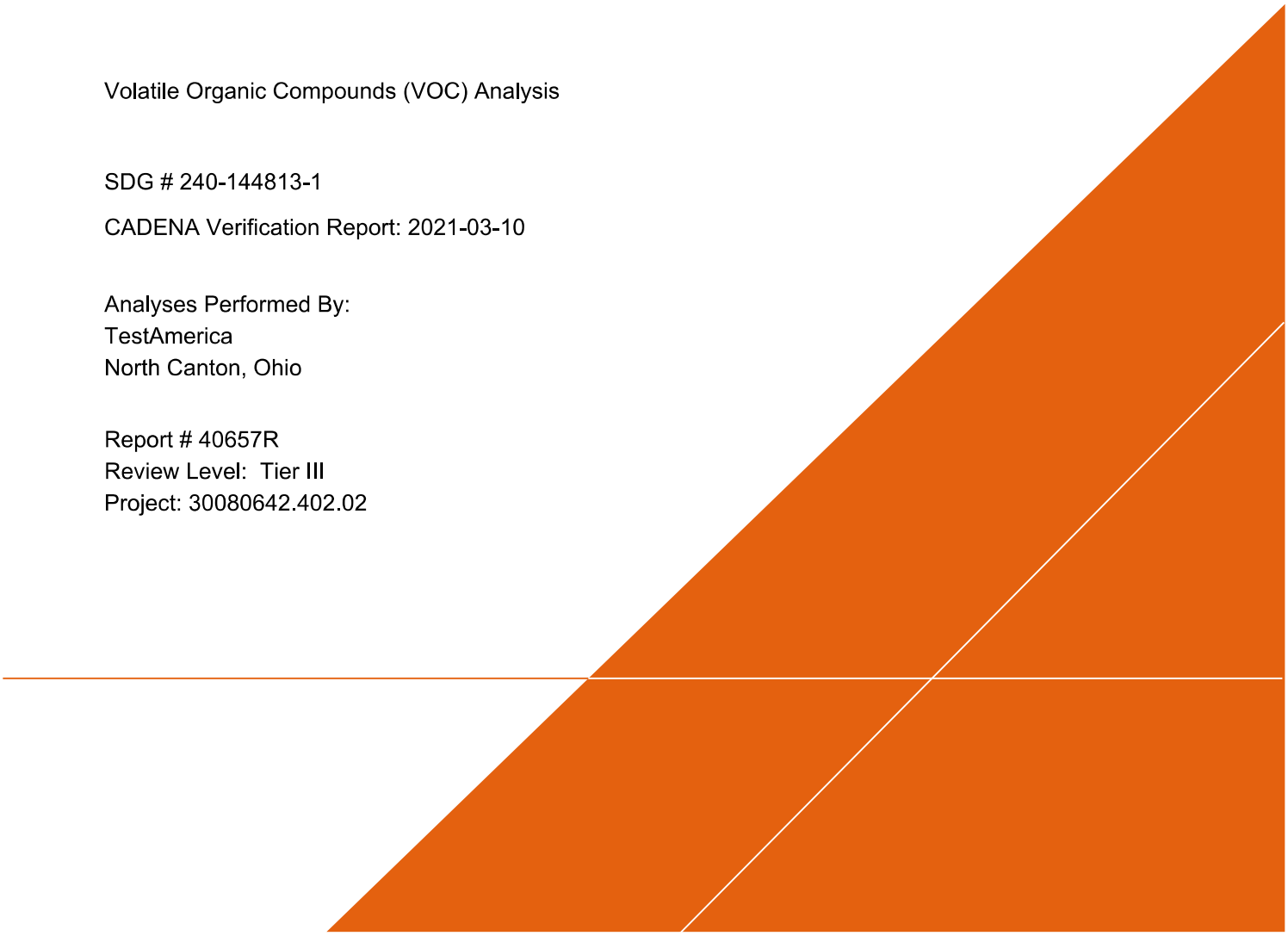
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144813-1

CADENA Verification Report: 2021-03-10

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40657R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144813-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144813-1	Water	02/22/2021		X	
MW-170S_022221	240-144813-2	Water	02/22/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial/Continuing	Compound	Criteria
TRIP BLANK MW-170S_022221	CCV %D	Tetrachloroethene	+21.9%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J

Initial/Continuing	Criteria	Sample Result	Qualification
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1] RRF of 0.01 only applies to compounds which are typically poor responding compounds (i.e., ketones, 1,4-dioxane, etc.)

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 22, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 24, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

1.2/1.3

Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica MICHIGAN 190

TestAmerica Laboratories, Inc.

Regulatory program: DW NPDES RCRA Other

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				/ of / COCs
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	For lab use only
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	Walk-in client
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30050315.402.04	Shipping/Tracking No:			
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/22/21			X						1							X	X	X	X	X	X	X	1 trip blank
MW-1705-022221	02/22/21	13:56 (13:34 for 2/23/21)		X						6					N	G	X	X	X	X	X	X	X	Method 8260B Method 8260B SIM

240-144813 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com, Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	02/22/21 1732	NOVI cold storage	Arcadis	02/22/21 1732
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Ashley McBreen	Arcadis	2/23/2021	Amanda Battershell	ETA	2/23/21 10:04
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
Amanda Battershell	ETA	2/23/21 10:47		TA	2-24-21 800

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03/10/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144813-1

Date Collected: 02/22/21 00:00
Matrix: Water
Date Received: 02/24/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 00:12	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 00:12	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 00:12	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 00:12	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 00:12	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 00:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*75 - 130*		*03/02/21 00:12*	*1*
4-Bromofluorobenzene (Surr)	*75*		*47 - 134*		*03/02/21 00:12*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*03/02/21 00:12*	*1*
Dibromofluoromethane (Surr)	*113*		*78 - 129*		*03/02/21 00:12*	*1*

Client Sample ID: MW-170S_022221
Lab Sample ID: 240-144813-2

Date Collected: 02/22/21 13:56
Matrix: Water
Date Received: 02/24/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 17:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*70 - 133*		*03/01/21 17:14*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 21:49	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 21:49	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 21:49	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 21:49	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 21:49	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 21:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*75 - 130*		*03/01/21 21:49*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*03/01/21 21:49*	*1*
Toluene-d8 (Surr)	*79*		*69 - 122*		*03/01/21 21:49*	*1*
Dibromofluoromethane (Surr)	*109*		*78 - 129*		*03/01/21 21:49*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144567-3
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/3/2021 10:27:21 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
Review your project results through TotalAccess
Have a Question? Ask The Expert
Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144567-3

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144567-3

Job ID: 240-144567-3

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144567-3

Comments
No additional comments.

Receipt
The samples were received on 2/17/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.5º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144567-3

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144567-3

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144567-4	MW-223S_021521	Water	02/15/21 15:08	02/17/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144567-3

Client Sample ID: MW-223S_021521 **Lab Sample ID: 240-144567-4**

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144567-3

Client Sample ID: MW-223S_021521
Date Collected: 02/15/21 15:08
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144567-4
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/24/21 19:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/24/21 19:01*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 15:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 15:46	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 15:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 15:46	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 15:46	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 15:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 130*		*02/24/21 15:46*	*1*
4-Bromofluorobenzene (Surr)	*98*		*47 - 134*		*02/24/21 15:46*	*1*
Toluene-d8 (Surr)	*95*		*69 - 122*		*02/24/21 15:46*	*1*
Dibromofluoromethane (Surr)	*92*		*78 - 129*		*02/24/21 15:46*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144567-3

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144567-4	MW-223S_021521	88	98	95	92
240-144568-D-2 MS	Matrix Spike	87	98	93	89
240-144568-E-2 MSD	Matrix Spike Duplicate	86	100	92	91
LCS 240-474307/4	Lab Control Sample	84	101	92	89
MB 240-474307/7	Method Blank	87	103	92	89

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144567-4	MW-223S_021521	83
240-144568-J-2 MS	Matrix Spike	81
240-144568-J-2 MSD	Matrix Spike Duplicate	82
LCS 240-474283/4	Lab Control Sample	84
MB 240-474283/5	Method Blank	86

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474307/7
Matrix: Water
Analysis Batch: 474307

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 14:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 14:06	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 14:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 14:06	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 14:06	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 14:06	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 130*		*02/24/21 14:06*	*1*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*		*02/24/21 14:06*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*02/24/21 14:06*	*1*
Dibromofluoromethane (Surr)	*89*		*78 - 129*		*02/24/21 14:06*	*1*

Lab Sample ID: LCS 240-474307/4
Matrix: Water
Analysis Batch: 474307

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.71		ug/L		97	73 - 129
cis-1,2-Dichloroethene	10.0	10.6		ug/L		106	75 - 124
Tetrachloroethene	10.0	9.87		ug/L		99	70 - 125
trans-1,2-Dichloroethene	10.0	10.3		ug/L		103	74 - 130
Trichloroethene	10.0	9.93		ug/L		99	71 - 121
Vinyl chloride	10.0	11.5		ug/L		115	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*
4-Bromofluorobenzene (Surr)	*101*		*47 - 134*
Toluene-d8 (Surr)	*92*		*69 - 122*
Dibromofluoromethane (Surr)	*89*		*78 - 129*

Lab Sample ID: 240-144568-D-2 MS
Matrix: Water
Analysis Batch: 474307

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.77		ug/L		98	64 - 132
cis-1,2-Dichloroethene	0.43	J	10.0	10.1		ug/L		97	68 - 121
Tetrachloroethene	1.0	U	10.0	9.57		ug/L		96	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.78		ug/L		98	69 - 126
Trichloroethene	1.0	U	10.0	9.70		ug/L		97	56 - 124
Vinyl chloride	1.0	U	10.0	11.4		ug/L		114	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 130*
4-Bromofluorobenzene (Surr)	*98*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144568-D-2 MS
Matrix: Water
Analysis Batch: 474307

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*89*		*78 - 129*

Lab Sample ID: 240-144568-E-2 MSD
Matrix: Water
Analysis Batch: 474307

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.63		ug/L		96	64 - 132	1	35
cis-1,2-Dichloroethene	0.43	J	10.0	10.2		ug/L		98	68 - 121	1	35
Tetrachloroethene	1.0	U	10.0	8.84		ug/L		88	52 - 129	8	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.59		ug/L		96	69 - 126	2	35
Trichloroethene	1.0	U	10.0	9.53		ug/L		95	56 - 124	2	35
Vinyl chloride	1.0	U	10.0	11.7		ug/L		117	49 - 136	2	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*
4-Bromofluorobenzene (Surr)	*100*		*47 - 134*
Toluene-d8 (Surr)	*92*		*69 - 122*
Dibromofluoromethane (Surr)	*91*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474283/5
Matrix: Water
Analysis Batch: 474283

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/24/21 11:01	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*		*02/24/21 11:01*	*1*

Lab Sample ID: LCS 240-474283/4
Matrix: Water
Analysis Batch: 474283

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.5		ug/L		105	80 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*

Lab Sample ID: 240-144568-J-2 MS
Matrix: Water
Analysis Batch: 474283

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	9.90		ug/L		99	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

Lab Sample ID: 240-144568-J-2 MSD
Matrix: Water
Analysis Batch: 474283

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.89		ug/L		99	46 - 170	0	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144567-3

GC/MS VOA

Analysis Batch: 474283

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144567-4	MW-223S_021521	Total/NA	Water	8260B SIM	
MB 240-474283/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474283/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144568-J-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144568-J-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474307

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144567-4	MW-223S_021521	Total/NA	Water	8260B	
MB 240-474307/7	Method Blank	Total/NA	Water	8260B	
LCS 240-474307/4	Lab Control Sample	Total/NA	Water	8260B	
240-144568-D-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144568-E-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144567-3

Client Sample ID: MW-223S_021521
Date Collected: 02/15/21 15:08
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144567-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474307	02/24/21 15:46	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474283	02/24/21 19:01	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144567-3

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

0.4/6.5

Chain of Custody Record

MICHIGAN 190

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Kara Donahue		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below

10 day ✓ 3 weeks ✓ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day

Analyses

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-156S_021521	2/15/21	1028		6						6					N	G	X	X	X	X	X	X	X	3 VOAS for 8260B 3 VOAS for 8260B SIM
MW-118S_021521	2/15/21	1228		6						6					N	G	X	X	X	X	X	X	X	
MW-223S_021521	2/15/21	1508		6						6					N	G	X	X	X	X	X	X	X	

240-144567 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ✓ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Kara Donahue	Arcadis	2/15/21 1653	Novi Cold Storage	Arcadis	2/15/21 1653
Christine Ulen	ARCADIS	2/16/21 / 1009	Amanda Battershell	ETA	2/16/21 / 10:09
Amanda Battershell	ETA	2/16/21 12:40	Received in Laboratory by: [signature]	ETA	2-17-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 144567**
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: MathSmc

Cooler Received on 2-17-21 Opened on 2-17-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # NA Foam Box Client Cooler Box Other _____

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 0.4 °C Corrected Cooler Temp. 0.5 °C

IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   - Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   - Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   - Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? (Yes) No
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)? (Y) (Y) (Y)
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# **HC907861**
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #_____ (Yes) No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

March 03, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144567-3
Sample date: 2021-02-15
Report received by CADENA: 2021-03-03
Initial Data Verification completed by CADENA: 2021-03-03
Number of Samples:1
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144567-3

Sample Name: MW-223S_021521
Lab Sample ID: 2401445674
Sample Date: 2/15/2021

Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC					
OSW-8260B					
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---
OSW-8260BBSim					
1,4-Dioxane	123-91-1	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

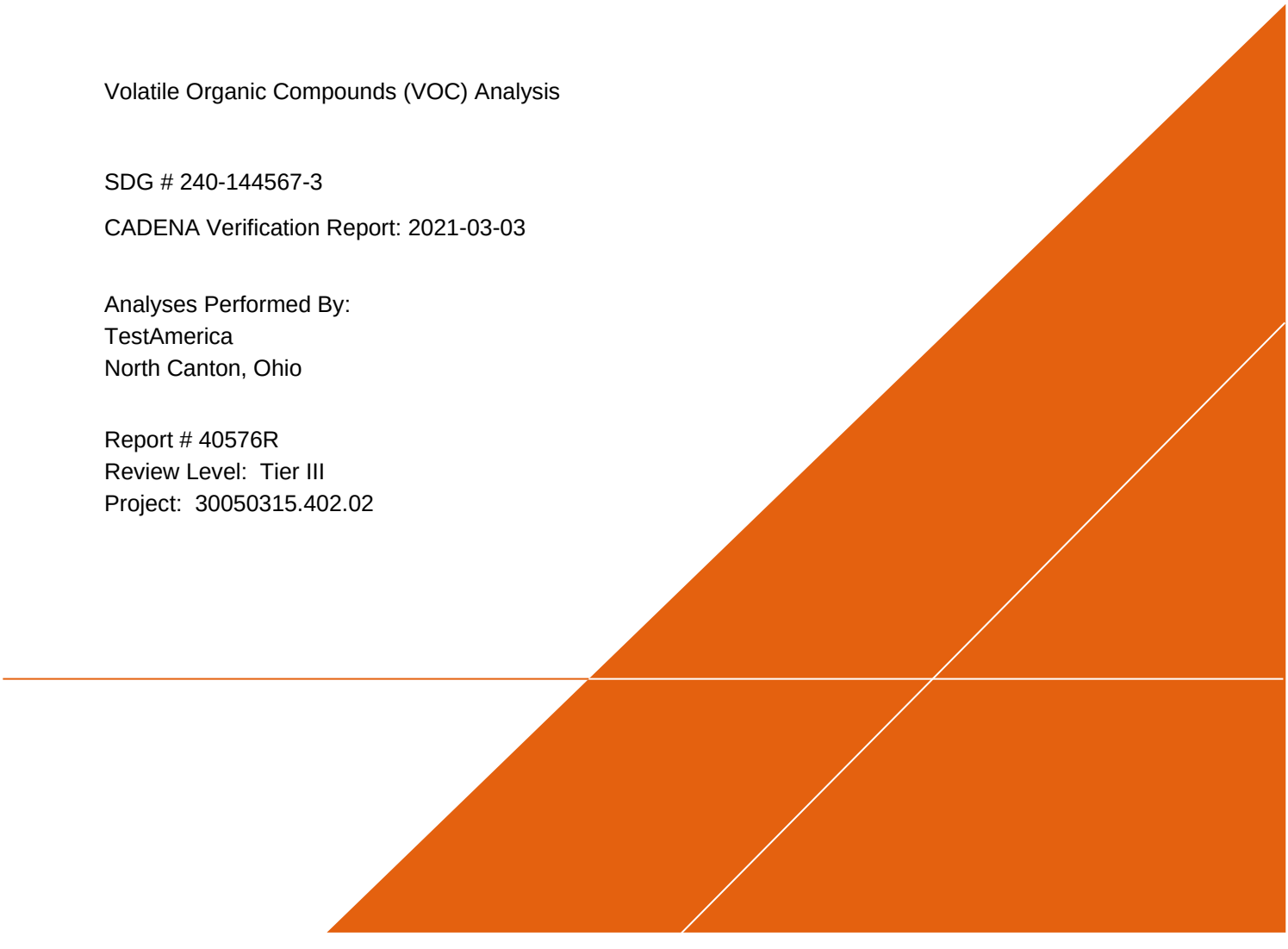
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144567-3

CADENA Verification Report: 2021-03-03

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40576R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144567-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
MW-223S_021521	240-144567-4	Water	02/15/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

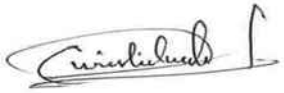
%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 17, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

0.4/6.5

Chain of Custody Record

MICHIGAN 190

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	DW NPDES RCRA Other	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
Address: 28550 Cabot Drive, Suite 500		Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377		Sampler Name: Kara Donahue	TAT if different from below: 10 day; 3 weeks, ✓ 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Phone: 248-994-2240		Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site		Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04					
PO # 30050315.402.04					

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-156S_021521	2/15/21	1028		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B, 3 VOAs for 8260B SIM
MW-118S_021521	2/15/21	1228		6						6					N	G	X	X	X	X	X	X	X	
MW-223S_021521	2/15/21	1508		6						6					N	G	X	X	X	X	X	X	X	

240-144567 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; ✓ Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Kara Donahue	Arcadis	2/15/21 1653	Novi Cold Storage	Arcadis	2/15/21 1653
Christopher Ilten	ARCADIS	2/16/21 1009	Amanda Battershell	ETA	2/16/21 10:09
Amanda Battershell	ETA	2/16/21 12:40	Received in Laboratory by:	Company:	Date/Time:
				ETA	2-17-21 800

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03/03/2021

Client Sample ID: MW-223S_021521
Lab Sample ID: 240-144567-4

Date Collected: 02/15/21 15:08
Matrix: Water
Date Received: 02/17/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/24/21 19:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/24/21 19:01*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 15:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 15:46	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 15:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 15:46	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 15:46	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 15:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 130*		*02/24/21 15:46*	*1*
4-Bromofluorobenzene (Surr)	*98*		*47 - 134*		*02/24/21 15:46*	*1*
Toluene-d8 (Surr)	*95*		*69 - 122*		*02/24/21 15:46*	*1*
Dibromofluoromethane (Surr)	*92*		*78 - 129*		*02/24/21 15:46*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144748-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/9/2021 9:56:31 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
Review your project results through TotalAccess
Have a Question? Ask The Expert
Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144748-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144748-1

Job ID: 240-144748-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144748-1

Comments
No additional comments.

Receipt
The samples were received on 2/23/2021 9:20 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.6º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144748-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144748-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144748-1	TRIP BLANK	Water	02/19/21 00:00	02/23/21 09:20	
240-144748-2	MW-215S_021921	Water	02/19/21 15:00	02/23/21 09:20	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144748-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144748-1

No Detections.

Client Sample ID: MW-215S_021921 — Lab Sample ID: 240-144748-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144748-1

Client Sample ID: TRIP BLANK

Date Collected: 02/19/21 00:00
Date Received: 02/23/21 09:20

Lab Sample ID: 240-144748-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 13:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 13:57	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 13:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 13:57	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 13:57	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 13:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*03/01/21 13:57*	*1*
4-Bromofluorobenzene (Surr)	*99*		*47 - 134*		*03/01/21 13:57*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*03/01/21 13:57*	*1*
Dibromofluoromethane (Surr)	*106*		*78 - 129*		*03/01/21 13:57*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144748-1

Client Sample ID: MW-215S_021921
Date Collected: 02/19/21 15:00
Date Received: 02/23/21 09:20

Lab Sample ID: 240-144748-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 15:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*70 - 133*		*02/26/21 15:54*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 14:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 14:22	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 14:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 14:22	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 14:22	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 14:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*03/01/21 14:22*	*1*
4-Bromofluorobenzene (Surr)	*104*		*47 - 134*		*03/01/21 14:22*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*03/01/21 14:22*	*1*
Dibromofluoromethane (Surr)	*108*		*78 - 129*		*03/01/21 14:22*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144748-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144748-1	TRIP BLANK	104	99	90	106
240-144748-2	MW-215S_021921	104	104	92	108
240-144754-B-2 MS	Matrix Spike	93	104	94	93
240-144754-B-2 MSD	Matrix Spike Duplicate	93	103	93	95
LCS 240-474864/5	Lab Control Sample	92	101	93	91
MB 240-474864/8	Method Blank	101	102	93	99

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144711-O-2 MS	Matrix Spike	85
240-144711-O-2 MSD	Matrix Spike Duplicate	86
240-144748-2	MW-215S_021921	87
LCS 240-474631/4	Lab Control Sample	82
MB 240-474631/5	Method Blank	80

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474864/8
Matrix: Water
Analysis Batch: 474864

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 13:08	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 13:08	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 13:08	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 13:08	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 13:08	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 13:08	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*03/01/21 13:08*	*1*
4-Bromofluorobenzene (Surr)	*102*		*47 - 134*		*03/01/21 13:08*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*03/01/21 13:08*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*03/01/21 13:08*	*1*

Lab Sample ID: LCS 240-474864/5
Matrix: Water
Analysis Batch: 474864

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	20.0	20.5		ug/L		103	73 - 129
cis-1,2-Dichloroethene	20.0	20.9		ug/L		104	75 - 124
Tetrachloroethene	20.0	20.8		ug/L		104	70 - 125
trans-1,2-Dichloroethene	20.0	20.5		ug/L		102	74 - 130
Trichloroethene	20.0	19.8		ug/L		99	71 - 121
Vinyl chloride	20.0	23.6		ug/L		118	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*
4-Bromofluorobenzene (Surr)	*101*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*91*		*78 - 129*

Lab Sample ID: 240-144754-B-2 MS
Matrix: Water
Analysis Batch: 474864

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	500	U	10000	9650		ug/L		96	64 - 132
Tetrachloroethene	500	U	10000	9480		ug/L		95	52 - 129
trans-1,2-Dichloroethene	210	J	10000	9670		ug/L		95	69 - 126
Trichloroethene	500	U	10000	9110		ug/L		91	56 - 124
Vinyl chloride	12000		10000	22900		ug/L		111	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*104*		*47 - 134*
Toluene-d8 (Surr)	*94*		*69 - 122*
Dibromofluoromethane (Surr)	*93*		*78 - 129*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144754-B-2 MSD
Matrix: Water
Analysis Batch: 474864

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	500	U	10000	10800		ug/L		108	64 - 132	11	35
Tetrachloroethene	500	U	10000	10200		ug/L		102	52 - 129	7	35
trans-1,2-Dichloroethene	210	J	10000	10800		ug/L		106	69 - 126	11	35
Trichloroethene	500	U	10000	9990		ug/L		100	56 - 124	9	35
Vinyl chloride	12000		10000	25200		ug/L		134	49 - 136	9	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*95*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474631/5
Matrix: Water
Analysis Batch: 474631

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 10:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/26/21 10:51*	*1*

Lab Sample ID: LCS 240-474631/4
Matrix: Water
Analysis Batch: 474631

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	9.80		ug/L		98	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144711-O-2 MS
Matrix: Water
Analysis Batch: 474631

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	9.26		ug/L		93	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*70 - 133*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144711-O-2 MSD
Matrix: Water
Analysis Batch: 474631

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.91		ug/L		99	46 - 170	7	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144748-1

GC/MS VOA

Analysis Batch: 474631

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144748-2	MW-215S_021921	Total/NA	Water	8260B SIM	
MB 240-474631/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474631/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144711-O-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144711-O-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474864

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144748-1	TRIP BLANK	Total/NA	Water	8260B	
240-144748-2	MW-215S_021921	Total/NA	Water	8260B	
MB 240-474864/8	Method Blank	Total/NA	Water	8260B	
LCS 240-474864/5	Lab Control Sample	Total/NA	Water	8260B	
240-144754-B-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144754-B-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144748-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144748-1

Date Collected: 02/19/21 00:00

Matrix: Water

Date Received: 02/23/21 09:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474864	03/01/21 13:57	HMB	TAL CAN

Client Sample ID: MW-215S_021921

Lab Sample ID: 240-144748-2

Date Collected: 02/19/21 15:00

Matrix: Water

Date Received: 02/23/21 09:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474864	03/01/21 14:22	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		1	474631	02/26/21 15:54	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144748-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

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TestAmerica

Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Emma Witherspoon		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

COC No:

of COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below

10 day — 3 weeks / 2 weeks / 1 week / 2 days / 1 day

Analyses

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM					Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X					1 Trip blank
MW-215S_021921	2/19/21	1500		6						6					N	G	X	X	X	X	X	X	X					3 vocs for 8260B 3 vocs for 8260B SIM

240-144748 Chain of Custody

Possible Hazard Identification: Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / Disposal By Lab / Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
E Witherspoon	Arcadis	2/19/21 / 1700	Novi Cold Storage	Arcadis	2/19/21 / 1700
Julia McClafferty	Arcadis	2/22/2021 /	Amanda Battishill	ETA	2/22/21 10:08
Amanda Battishill	ETA	2/22/21 11:19	Received in Laboratory by:	Company: TA	Date/Time: 2-23-21 920

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 142748
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by:

Cooler Received on 2-23-21 Opened on 2-23-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2-5 °C Corrected Cooler Temp. 2-6 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC907861
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page — Samples processed by:

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

March 09, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144748-1
Sample date: 2021-02-19
Report received by CADENA: 2021-03-09
Initial Data Verification completed by CADENA: 2021-03-09
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144748-1

		Sample Name:	TRIP BLANK				MW-215S_021921			
		Lab Sample ID:	2401447481				2401447482			
		Sample Date:	2/19/2021				2/19/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

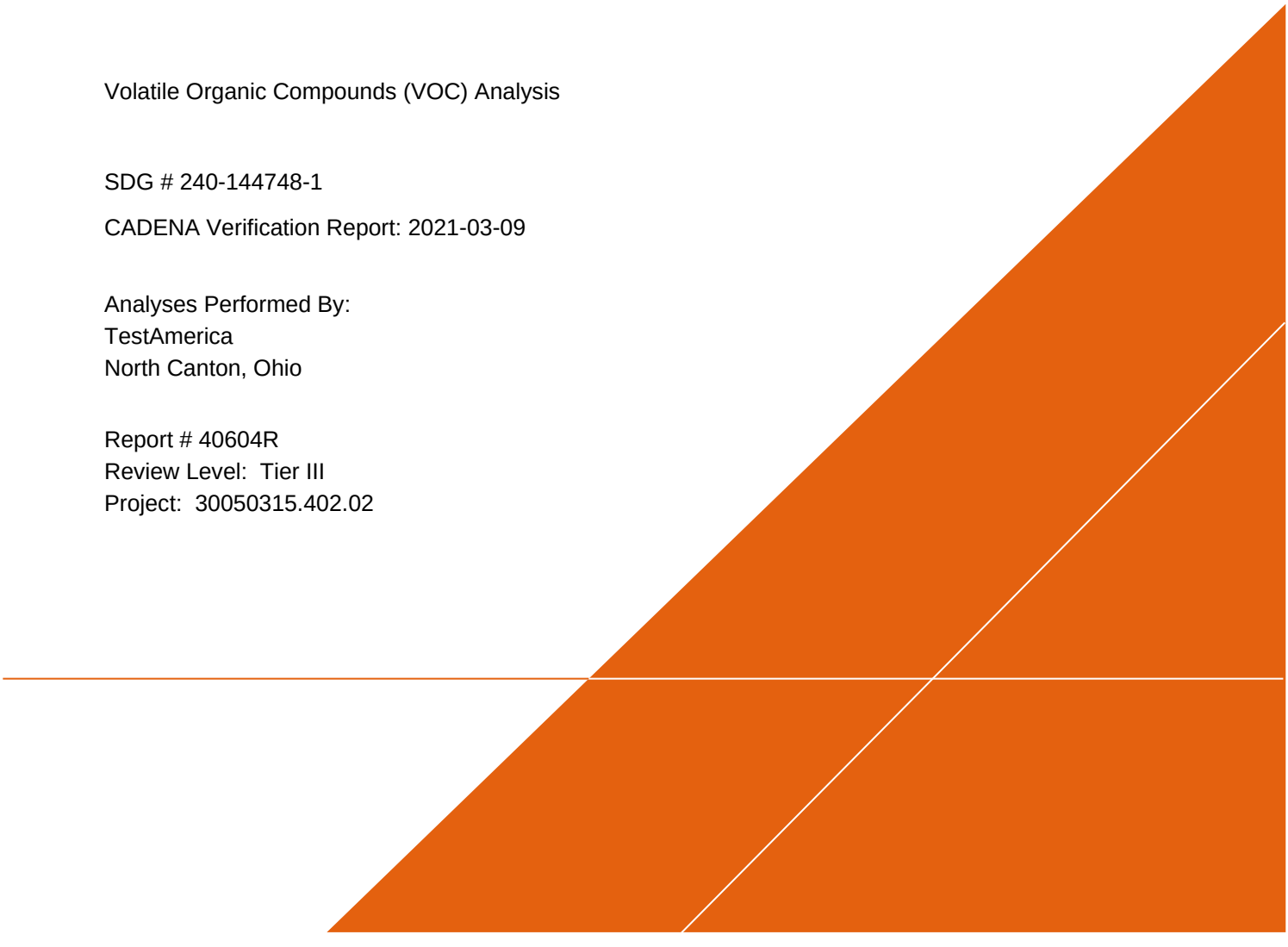
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144748-1

CADENA Verification Report: 2021-03-09

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40604R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144748-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144748-1	Water	02/19/2021		X	
MW-215S_021921	240-144748-2	Water	02/19/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

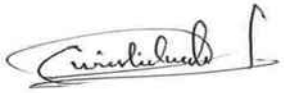
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 18, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 18, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190 TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; 3 weeks / 2 weeks / 1 week / 2 days / 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 trip blank
MW-21SS_021921	2/19/21	1500		6						6					N	G	X	X	X	X	X	X	X	3 vocs for 8260B 3vocs for 8260B SIM

240-144748 Chain of Custody

Possible Hazard Identification: Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / Disposal By Lab / Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by: Emma Witherspoon	Arcadis	2/19/21 1700	Novi cold storage	Arcadis	2/19/21 1700
Relinquished by: Julia McClafferty	Arcadis	2/22/2021	Amanda Battenfield	ETA	2/22/21 10:05
Relinquished by: Amanda Battenfield	ETA	2/22/21 11:19	Received in Laboratory by:	TA	Date/Time: 2-23-21 920

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03/09/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144748-1
Date Collected: 02/19/21 00:00
Matrix: Water
Date Received: 02/23/21 09:20

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 13:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 13:57	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 13:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 13:57	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 13:57	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 13:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*03/01/21 13:57*	*1*
4-Bromofluorobenzene (Surr)	*99*		*47 - 134*		*03/01/21 13:57*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*03/01/21 13:57*	*1*
Dibromofluoromethane (Surr)	*106*		*78 - 129*		*03/01/21 13:57*	*1*

Client Sample ID: MW-215S_021921
Lab Sample ID: 240-144748-2
Date Collected: 02/19/21 15:00
Matrix: Water
Date Received: 02/23/21 09:20

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 15:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*70 - 133*		*02/26/21 15:54*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 14:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 14:22	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 14:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 14:22	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 14:22	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 14:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*03/01/21 14:22*	*1*
4-Bromofluorobenzene (Surr)	*104*		*47 - 134*		*03/01/21 14:22*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*03/01/21 14:22*	*1*
Dibromofluoromethane (Surr)	*108*		*78 - 129*		*03/01/21 14:22*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144814-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/10/2021 9:11:20 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
Review your project results through TotalAccess
Have a Question? Ask The Expert
Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144814-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144814-1

Job ID: 240-144814-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144814-1

Comments
No additional comments.

Receipt
The samples were received on 2/24/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.3º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144814-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144814-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144814-1	TRIP BLANK	Water	02/22/21 00:00	02/24/21 08:00	
240-144814-2	MW-191S_022221	Water	02/22/21 16:30	02/24/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144814-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144814-1

No Detections.

Client Sample ID: MW-191S_022221 — Lab Sample ID: 240-144814-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	4.1		1.0	0.16	ug/L	1		8260B	Total/NA
Trichloroethene	0.35	J	1.0	0.10	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144814-1

Client Sample ID: TRIP BLANK
Date Collected: 02/22/21 00:00
Date Received: 02/24/21 08:00

Lab Sample ID: 240-144814-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 00:35	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 00:35	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 00:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 00:35	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 00:35	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 00:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*75 - 130*		*03/02/21 00:35*	*1*
4-Bromofluorobenzene (Surr)	*58*		*47 - 134*		*03/02/21 00:35*	*1*
Toluene-d8 (Surr)	*73*		*69 - 122*		*03/02/21 00:35*	*1*
Dibromofluoromethane (Surr)	*101*		*78 - 129*		*03/02/21 00:35*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144814-1

Client Sample ID: MW-191S_022221
Date Collected: 02/22/21 16:30
Date Received: 02/24/21 08:00

Lab Sample ID: 240-144814-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 17:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*70 - 133*		*03/01/21 17:39*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 22:13	1
cis-1,2-Dichloroethene	**4.1**		1.0	0.16	ug/L			03/01/21 22:13	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 22:13	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 22:13	1
Trichloroethene	**0.35**	**J**	1.0	0.10	ug/L			03/01/21 22:13	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 22:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*113*		*75 - 130*		*03/01/21 22:13*	*1*
4-Bromofluorobenzene (Surr)	*68*		*47 - 134*		*03/01/21 22:13*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*03/01/21 22:13*	*1*
Dibromofluoromethane (Surr)	*112*		*78 - 129*		*03/01/21 22:13*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144814-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144807-G-4 MS	Matrix Spike	92	91	89	96
240-144807-H-4 MSD	Matrix Spike Duplicate	86	91	88	90
240-144814-1	TRIP BLANK	112	58	73	101
240-144814-2	MW-191S_022221	113	68	80	112
LCS 240-474892/4	Lab Control Sample	88	89	89	89
MB 240-474892/7	Method Blank	104	70	82	110

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144807-J-4 MS	Matrix Spike	90
240-144807-J-4 MSD	Matrix Spike Duplicate	88
240-144814-2	MW-191S_022221	95
LCS 240-474842/4	Lab Control Sample	90
MB 240-474842/5	Method Blank	86

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474892/7
Matrix: Water
Analysis Batch: 474892

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 15:51	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 15:51	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 15:51	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 15:51	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 15:51	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 15:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*03/01/21 15:51*	*1*
4-Bromofluorobenzene (Surr)	*70*		*47 - 134*		*03/01/21 15:51*	*1*
Toluene-d8 (Surr)	*82*		*69 - 122*		*03/01/21 15:51*	*1*
Dibromofluoromethane (Surr)	*110*		*78 - 129*		*03/01/21 15:51*	*1*

Lab Sample ID: LCS 240-474892/4
Matrix: Water
Analysis Batch: 474892

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.84		ug/L		98	73 - 129
cis-1,2-Dichloroethene	10.0	9.22		ug/L		92	75 - 124
Tetrachloroethene	10.0	10.9		ug/L		109	70 - 125
trans-1,2-Dichloroethene	10.0	9.78		ug/L		98	74 - 130
Trichloroethene	10.0	9.30		ug/L		93	71 - 121
Vinyl chloride	10.0	9.80		ug/L		98	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 130*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*
Toluene-d8 (Surr)	*89*		*69 - 122*
Dibromofluoromethane (Surr)	*89*		*78 - 129*

Lab Sample ID: 240-144807-G-4 MS
Matrix: Water
Analysis Batch: 474892

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.25		ug/L		93	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	9.38		ug/L		94	68 - 121
Tetrachloroethene	1.0	U	10.0	11.7		ug/L		117	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.98		ug/L		100	69 - 126
Trichloroethene	1.0	U	10.0	9.60		ug/L		96	56 - 124
Vinyl chloride	1.0	U	10.0	10.4		ug/L		104	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*
Toluene-d8 (Surr)	*89*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144807-G-4 MS
Matrix: Water
Analysis Batch: 474892

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*96*		*78 - 129*

Lab Sample ID: 240-144807-H-4 MSD
Matrix: Water
Analysis Batch: 474892

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.00		ug/L		90	64 - 132	3	35
cis-1,2-Dichloroethene	1.0	U	10.0	8.99		ug/L		90	68 - 121	4	35
Tetrachloroethene	1.0	U	10.0	11.0		ug/L		110	52 - 129	6	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.43		ug/L		94	69 - 126	6	35
Trichloroethene	1.0	U	10.0	9.01		ug/L		90	56 - 124	6	35
Vinyl chloride	1.0	U	10.0	10.1		ug/L		101	49 - 136	3	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*
Toluene-d8 (Surr)	*88*		*69 - 122*
Dibromofluoromethane (Surr)	*90*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474842/5
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 12:12	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*		*03/01/21 12:12*	*1*

Lab Sample ID: LCS 240-474842/4
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.05		ug/L		91	80 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*70 - 133*

Lab Sample ID: 240-144807-J-4 MS
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	8.95		ug/L		90	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*90*		*70 - 133*

Lab Sample ID: 240-144807-J-4 MSD
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.28		ug/L		93	46 - 170	4	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144814-1

GC/MS VOA

Analysis Batch: 474842

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144814-2	MW-191S_022221	Total/NA	Water	8260B SIM	
MB 240-474842/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474842/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144807-J-4 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144807-J-4 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474892

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144814-1	TRIP BLANK	Total/NA	Water	8260B	
240-144814-2	MW-191S_022221	Total/NA	Water	8260B	
MB 240-474892/7	Method Blank	Total/NA	Water	8260B	
LCS 240-474892/4	Lab Control Sample	Total/NA	Water	8260B	
240-144807-G-4 MS	Matrix Spike	Total/NA	Water	8260B	
240-144807-H-4 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144814-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144814-1

Date Collected: 02/22/21 00:00

Matrix: Water

Date Received: 02/24/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474892	03/02/21 00:35	LRW	TAL CAN

Client Sample ID: MW-191S_022221

Lab Sample ID: 240-144814-2

Date Collected: 02/22/21 16:30

Matrix: Water

Date Received: 02/24/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474892	03/01/21 22:13	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474842	03/01/21 17:39	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144814-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

1-2 11.3

MICHIGAN 190 TestAmerica

Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No:
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day	of COCs
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		For lab use only: Walk-in client; Lab sampling; Job/SDG No:
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-19IS-022221	2/22/21	1630		6						6					N	G	X	X	X	X	X	X	X	3 vocs for 8260B; 3 vocs for 8260B SIM

240-144814 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company:	Date/Time:		Company:	Date/Time:
Relinquished by: Elyse Witherspoon	Arcadis	2/22/21 1740	Received by: Novi Cold Storage	Arcadis	2/22/21 1740
Relinquished by: Julia McClafferty	Arcadis	2/23/2021	Received by: Amanda Battenfield	ETA	2/23/21 10.04
Relinquished by: Amanda Battenfield	ETA	2/23/21 10.47	Received in Laboratory by:	TA	2-24-21 800

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3/10/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 144814
Canton Facility

Client Arcadis Site Name

Cooler Received on 2-24-21 Opened on 2-24-21

Cooler unpacked by:

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1-2 °C Corrected Cooler Temp. 1-3 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
   -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? Yes No
11. Sufficient quantity received to perform indicated analyses? Yes No
12. Are these work share samples and all listed on the COC? Yes No
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC907861
14. Were VOAs on the COC? Yes No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this. Yes No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # Yes No
17. Was a LL Hg or Me Hg trip blank present? Yes No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container.
Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.
Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

DATA VERIFICATION REPORT

March 10, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144814-1
Sample date: 2021-02-22
Report received by CADENA: 2021-03-10
Initial Data Verification completed by CADENA: 2021-03-10
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144814-1

		Sample Name:	TRIP BLANK				MW-191S_022221			
		Lab Sample ID:	2401448141				2401448142			
		Sample Date:	2/22/2021				2/22/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	4.1	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	0.35	1.0	ug/l	J
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

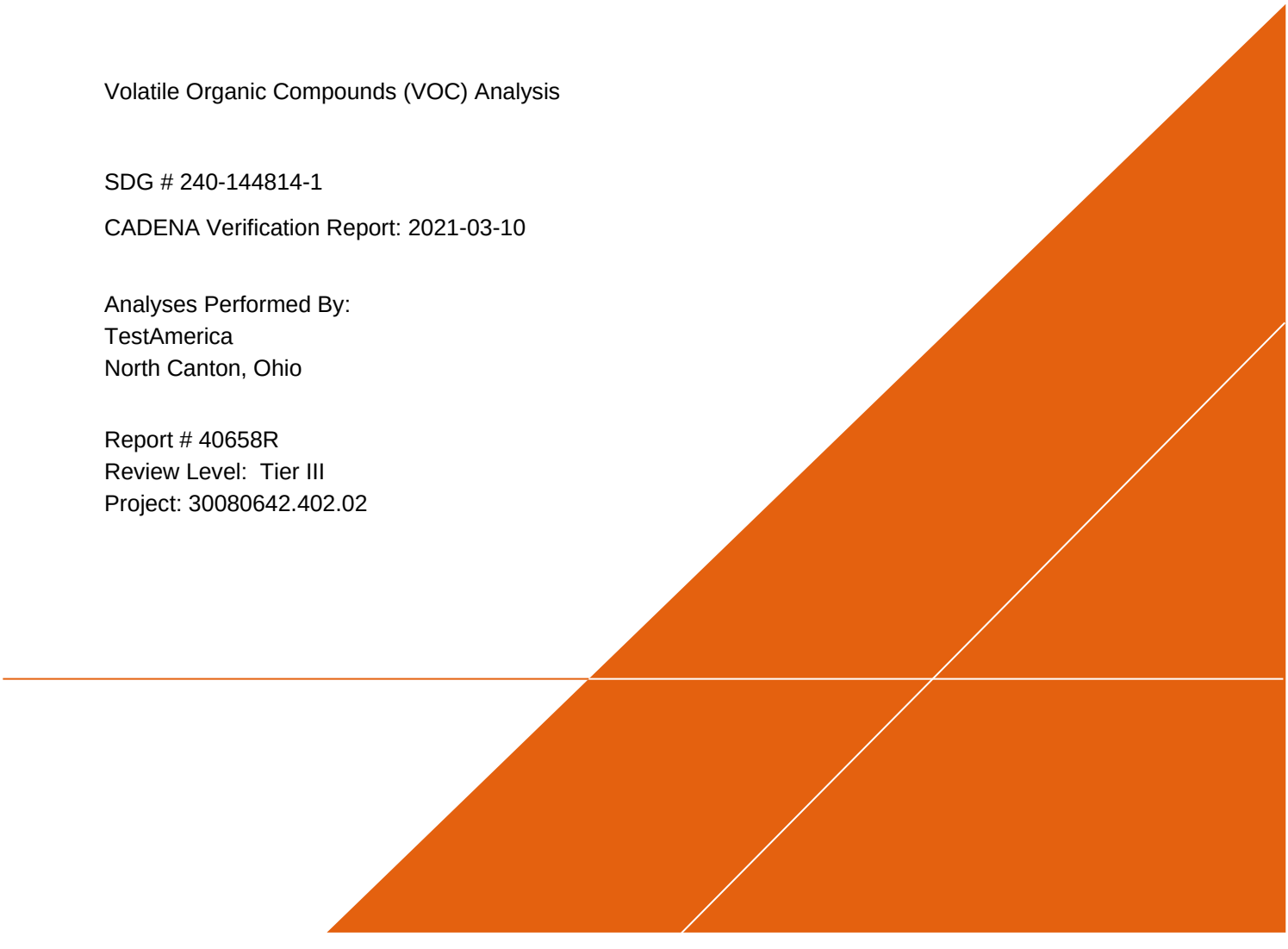
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144814-1

CADENA Verification Report: 2021-03-10

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40658R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144814-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144814-1	Water	02/22/2021		X	
MW-191S_022221	240-144814-2	Water	02/22/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial/Continuing	Compound	Criteria
TRIP BLANK MW-191S_022221	CCV %D	Tetrachloroethene	+21.9%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J

Initial/Continuing	Criteria	Sample Result	Qualification
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1] RRF of 0.01 only applies to compounds which are typically poor responding compounds (i.e., ketones, 1,4-dioxane, etc.)

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

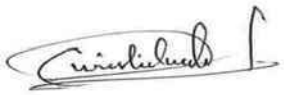
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 22, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 24, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

1-2 11.3

Chain of Custody Record

MICHIGAN 190 TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac/ NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-19IS-022221	2/22/21	1630		6						6					N	G	X	X	X	X	X	X	X	3 vocs for 8260B 3 vocs for 8260B SIM

240-144814 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Emma Witherspoon	Arcadis	2/22/21 1740	Novi Cold Storage	Arcadis	2/22/21 1740
Julia McClafferty	Arcadis	2/23/2021	Amanda Battershell	ETA	2/23/21 10.04
Amanda Battershell	ETA	2/23/21 10.47	Received in Laboratory by:	TA	2-24-21 800

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03/10/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144814-1
Date Collected: 02/22/21 00:00
Matrix: Water
Date Received: 02/24/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 00:35	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/02/21 00:35	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/02/21 00:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/02/21 00:35	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/02/21 00:35	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/02/21 00:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*75 - 130*		*03/02/21 00:35*	*1*
4-Bromofluorobenzene (Surr)	*58*		*47 - 134*		*03/02/21 00:35*	*1*
Toluene-d8 (Surr)	*73*		*69 - 122*		*03/02/21 00:35*	*1*
Dibromofluoromethane (Surr)	*101*		*78 - 129*		*03/02/21 00:35*	*1*

Client Sample ID: MW-191S_022221
Lab Sample ID: 240-144814-2
Date Collected: 02/22/21 16:30
Matrix: Water
Date Received: 02/24/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 17:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*70 - 133*		*03/01/21 17:39*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 22:13	1
cis-1,2-Dichloroethene	**4.1**		1.0	0.16	ug/L			03/01/21 22:13	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 22:13	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 22:13	1
Trichloroethene	**0.35**	**J**	1.0	0.10	ug/L			03/01/21 22:13	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 22:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*113*		*75 - 130*		*03/01/21 22:13*	*1*
4-Bromofluorobenzene (Surr)	*68*		*47 - 134*		*03/01/21 22:13*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*03/01/21 22:13*	*1*
Dibromofluoromethane (Surr)	*112*		*78 - 129*		*03/01/21 22:13*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144668-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/5/2021 2:32:16 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144668-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144668-1

Job ID: 240-144668-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144668-1

Comments
No additional comments.

Receipt
The samples were received on 2/19/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.4º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144668-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144668-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144668-1	TRIP BLANK	Water	02/17/21 00:00	02/19/21 08:00	
240-144668-2	MW-125S_021721	Water	02/17/21 09:40	02/19/21 08:00	
240-144668-3	MW-125_021721	Water	02/17/21 10:55	02/19/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144668-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144668-1

No Detections.

Client Sample ID: MW-125S_021721 — Lab Sample ID: 240-144668-2

No Detections.

Client Sample ID: MW-125_021721 — Lab Sample ID: 240-144668-3

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144668-1

Client Sample ID: TRIP BLANK

Date Collected: 02/17/21 00:00
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144668-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 19:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 19:46	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 19:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 19:46	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 19:46	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 19:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*111*		*75 - 130*		*02/25/21 19:46*	*1*
4-Bromofluorobenzene (Surr)	*66*		*47 - 134*		*02/25/21 19:46*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*02/25/21 19:46*	*1*
Dibromofluoromethane (Surr)	*110*		*78 - 129*		*02/25/21 19:46*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144668-1

Client Sample ID: MW-125S_021721
Date Collected: 02/17/21 09:40
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144668-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 21:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/25/21 21:07*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 23:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 23:44	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 23:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 23:44	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 23:44	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 23:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*75 - 130*		*02/25/21 23:44*	*1*
4-Bromofluorobenzene (Surr)	*66*		*47 - 134*		*02/25/21 23:44*	*1*
Toluene-d8 (Surr)	*79*		*69 - 122*		*02/25/21 23:44*	*1*
Dibromofluoromethane (Surr)	*108*		*78 - 129*		*02/25/21 23:44*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144668-1

Client Sample ID: MW-125_021721
Date Collected: 02/17/21 10:55
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144668-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 21:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/25/21 21:33*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 00:08	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 00:08	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 00:08	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 00:08	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 00:08	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 00:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*75 - 130*		*02/26/21 00:08*	*1*
4-Bromofluorobenzene (Surr)	*63*		*47 - 134*		*02/26/21 00:08*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*02/26/21 00:08*	*1*
Dibromofluoromethane (Surr)	*113*		*78 - 129*		*02/26/21 00:08*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144668-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144668-1	TRIP BLANK	111	66	80	110
240-144668-2	MW-125S_021721	112	66	79	108
240-144668-3	MW-125_021721	110	63	80	113
240-144711-E-2 MS	Matrix Spike	93	88	91	94
240-144711-F-2 MSD	Matrix Spike Duplicate	91	92	91	92
LCS 240-474507/4	Lab Control Sample	88	88	88	91
MB 240-474507/7	Method Blank	102	68	80	101

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144568-J-3 MS	Matrix Spike	79
240-144568-J-3 MSD	Matrix Spike Duplicate	83
240-144668-2	MW-125S_021721	80
240-144668-3	MW-125_021721	81
LCS 240-474490/4	Lab Control Sample	79
MB 240-474490/5	Method Blank	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474507/7
Matrix: Water
Analysis Batch: 474507

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 17:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 17:22	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 17:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 17:22	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 17:22	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 17:22	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*75 - 130*		*02/25/21 17:22*	*1*
4-Bromofluorobenzene (Surr)	*68*		*47 - 134*		*02/25/21 17:22*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*02/25/21 17:22*	*1*
Dibromofluoromethane (Surr)	*101*		*78 - 129*		*02/25/21 17:22*	*1*

Lab Sample ID: LCS 240-474507/4
Matrix: Water
Analysis Batch: 474507

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.27		ug/L		93	73 - 129
cis-1,2-Dichloroethene	10.0	9.22		ug/L		92	75 - 124
Tetrachloroethene	10.0	11.5		ug/L		115	70 - 125
trans-1,2-Dichloroethene	10.0	9.77		ug/L		98	74 - 130
Trichloroethene	10.0	9.71		ug/L		97	71 - 121
Vinyl chloride	10.0	8.03		ug/L		80	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 130*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*
Toluene-d8 (Surr)	*88*		*69 - 122*
Dibromofluoromethane (Surr)	*91*		*78 - 129*

Lab Sample ID: 240-144711-E-2 MS
Matrix: Water
Analysis Batch: 474507

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	8.83		ug/L		88	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	8.92		ug/L		89	68 - 121
Tetrachloroethene	1.0	U	10.0	11.2		ug/L		112	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.58		ug/L		96	69 - 126
Trichloroethene	1.0	U	10.0	9.00		ug/L		90	56 - 124
Vinyl chloride	1.0	U	10.0	8.39		ug/L		84	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*
Toluene-d8 (Surr)	*91*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144711-E-2 MS
Matrix: Water
Analysis Batch: 474507

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*94*		*78 - 129*

Lab Sample ID: 240-144711-F-2 MSD
Matrix: Water
Analysis Batch: 474507

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.03		ug/L		90	64 - 132	2	35
cis-1,2-Dichloroethene	1.0	U	10.0	9.44		ug/L		94	68 - 121	6	35
Tetrachloroethene	1.0	U	10.0	11.3		ug/L		113	52 - 129	1	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.55		ug/L		96	69 - 126	0	35
Trichloroethene	1.0	U	10.0	9.26		ug/L		93	56 - 124	3	35
Vinyl chloride	1.0	U	10.0	8.55		ug/L		86	49 - 136	2	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*91*		*75 - 130*
4-Bromofluorobenzene (Surr)	*92*		*47 - 134*
Toluene-d8 (Surr)	*91*		*69 - 122*
Dibromofluoromethane (Surr)	*92*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474490/5
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 12:43	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/25/21 12:43*	*1*

Lab Sample ID: LCS 240-474490/4
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.7		ug/L		107	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*

Lab Sample ID: 240-144568-J-3 MS
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	10.2		ug/L		102	46 - 170		

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*

Lab Sample ID: 240-144568-J-3 MSD
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.2		ug/L		102	46 - 170	0	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144668-1

GC/MS VOA

Analysis Batch: 474490

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144668-2	MW-125S_021721	Total/NA	Water	8260B SIM	
240-144668-3	MW-125_021721	Total/NA	Water	8260B SIM	
MB 240-474490/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474490/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144568-J-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144568-J-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474507

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144668-1	TRIP BLANK	Total/NA	Water	8260B	
240-144668-2	MW-125S_021721	Total/NA	Water	8260B	
240-144668-3	MW-125_021721	Total/NA	Water	8260B	
MB 240-474507/7	Method Blank	Total/NA	Water	8260B	
LCS 240-474507/4	Lab Control Sample	Total/NA	Water	8260B	
240-144711-E-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144711-F-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144668-1

Client Sample ID: TRIP BLANK
Date Collected: 02/17/21 00:00
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144668-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474507	02/25/21 19:46	LRW	TAL CAN

Client Sample ID: MW-125S_021721
Date Collected: 02/17/21 09:40
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144668-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474507	02/25/21 23:44	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474490	02/25/21 21:07	SAM	TAL CAN

Client Sample ID: MW-125_021721
Date Collected: 02/17/21 10:55
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144668-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474507	02/26/21 00:08	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474490	02/25/21 21:33	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144668-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Emma Witherspoon		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below: 10 day; 3 weeks; 2 weeks; 1 week; 2 days; 1 day

Analyses

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-125S_021721	2/17/21	940		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-125_021721	2/17/21	1055		6						6					N	G	X	X	X	X	X	X	X	

240-144668 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
E Witherspoon	Arcadis	2/17/21 / 1630	Christine Mu	Arcadis	2/17/21 / 1630
Christine Mu	ARCADIS	2/17/21 / 1700	NOVI COLD STORAGE	ARCADIS	2/17/21 / 1700
Julia McClafferty	Arcadis	2/18/2021	Received in Laboratory by:	Company: TA	Date/Time: 2-19-21 800

Arcadis Battishell ETA 2/18/21 11:38

Arcadis Battishell ETA 2/18/21 10:18

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 144668
Canton Facility

Client Arcadis Site Name

Cooler unpacked by:

Cooler Received on 2-19-21 Opened on 2-19-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.3 °C Corrected Cooler Temp. 1.4 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #____ (Yes) No
17. Was a LL Hg or Me Hg trip blank present? ____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

March 05, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144668-1
Sample date: 2021-02-17
Report received by CADENA: 2021-03-05
Initial Data Verification completed by CADENA: 2021-03-05
Number of Samples:3
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144668-1

		Sample Name:	TRIP BLANK				MW-125S_021721				MW-125_021721			
		Lab Sample ID:	2401446681				2401446682				2401446683			
		Sample Date:	2/17/2021				2/17/2021				2/17/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC													
OSW-8260B													
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim													
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

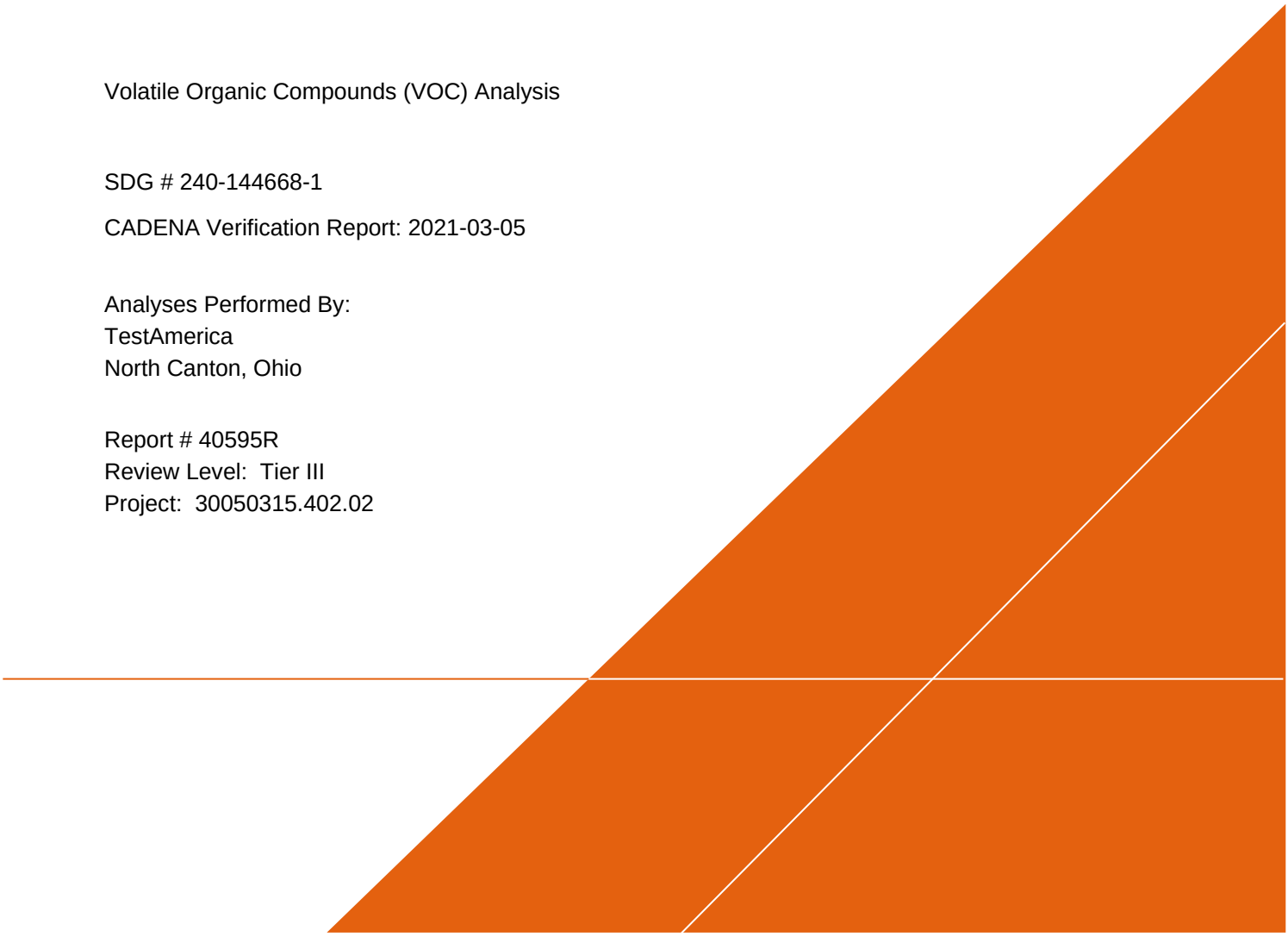
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144668-1

CADENA Verification Report: 2021-03-05

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40595R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144668-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144668-1	Water	02/17/2021		X	
MW-125S_021721	240-144668-2	Water	02/17/2021		X	X
MW-125_021721	240-144668-3	Water	02/17/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

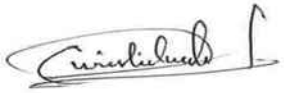
%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 17, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 18, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Emma Witherspoon		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below

10 day — 3 weeks, 2 weeks, 1 week, 2 days, 1 day

Analyses

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-125S_021721	2/17/21	940		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-125_021721	2/17/21	1055		6						6					N	G	X	X	X	X	X	X	X	

240-144668 Chain of Custody

Possible Hazard Identification: Non-Hazard, Flammable, Skin Irritant, Poison B, Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client, Disposal By Lab, Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
E Witherspoon	Arcadis	2/17/21 / 1630	Christine Hill	Arcadis	2/17/21 / 1630
Christine Hill	ARCADIS	2/17/21 / 1700	NOVI COLD STORAGE	ARCADIS	2/17/21 / 1700
[illegible]	Arcadis	2/18/2021	Received in Laboratory by:	TA	2-19-21 800

Anandi Battishill ETA 2/18/21 11:38

Anandi Battishill ETA 2/18/21 10:18

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Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144668-1

Date Collected: 02/17/21 00:00
Date Received: 02/19/21 08:00

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 19:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 19:46	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 19:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 19:46	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 19:46	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 19:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*111*		*75 - 130*		*02/25/21 19:46*	*1*
4-Bromofluorobenzene (Surr)	*66*		*47 - 134*		*02/25/21 19:46*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*02/25/21 19:46*	*1*
Dibromofluoromethane (Surr)	*110*		*78 - 129*		*02/25/21 19:46*	*1*

Client Sample ID: MW-125S_021721

Lab Sample ID: 240-144668-2

Date Collected: 02/17/21 09:40
Date Received: 02/19/21 08:00

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 21:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/25/21 21:07*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 23:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 23:44	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 23:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 23:44	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 23:44	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 23:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*75 - 130*		*02/25/21 23:44*	*1*
4-Bromofluorobenzene (Surr)	*66*		*47 - 134*		*02/25/21 23:44*	*1*
Toluene-d8 (Surr)	*79*		*69 - 122*		*02/25/21 23:44*	*1*
Dibromofluoromethane (Surr)	*108*		*78 - 129*		*02/25/21 23:44*	*1*

Client Sample ID: MW-125_021721

Lab Sample ID: 240-144668-3

Date Collected: 02/17/21 10:55
Date Received: 02/19/21 08:00

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 21:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/25/21 21:33*	*1*

Client Sample ID: MW-125_021721
Lab Sample ID: 240-144668-3
Date Collected: 02/17/21 10:55
Matrix: Water
Date Received: 02/19/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 00:08	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 00:08	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 00:08	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 00:08	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 00:08	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 00:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*75 - 130*		*02/26/21 00:08*	*1*
4-Bromofluorobenzene (Surr)	*63*		*47 - 134*		*02/26/21 00:08*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*02/26/21 00:08*	*1*
Dibromofluoromethane (Surr)	*113*		*78 - 129*		*02/26/21 00:08*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144705-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/8/2021 10:51:44 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144705-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144705-1

Job ID: 240-144705-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144705-1

Comments
No additional comments.

Receipt
The samples were received on 2/20/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.7º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144705-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144705-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144705-1	TRIP BLANK	Water	02/18/21 00:00	02/20/21 08:00	
240-144705-2	MW-129S_021821	Water	02/18/21 09:50	02/20/21 08:00	
240-144705-3	MW-129_021821	Water	02/18/21 11:20	02/20/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144705-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144705-1

No Detections.

Client Sample ID: MW-129S_021821 — Lab Sample ID: 240-144705-2

No Detections.

Client Sample ID: MW-129_021821 — Lab Sample ID: 240-144705-3

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144705-1

Client Sample ID: TRIP BLANK
Date Collected: 02/18/21 00:00
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144705-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 16:47	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 16:47	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 16:47	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 16:47	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 16:47	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 16:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*75 - 130*		*02/26/21 16:47*	*1*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*		*02/26/21 16:47*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*02/26/21 16:47*	*1*
Dibromofluoromethane (Surr)	*102*		*78 - 129*		*02/26/21 16:47*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144705-1

Client Sample ID: MW-129S_021821
Date Collected: 02/18/21 09:50
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144705-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 15:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/26/21 15:25*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 17:12	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 17:12	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 17:12	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 17:12	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 17:12	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 17:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*02/26/21 17:12*	*1*
4-Bromofluorobenzene (Surr)	*105*		*47 - 134*		*02/26/21 17:12*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*02/26/21 17:12*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*02/26/21 17:12*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144705-1

Client Sample ID: MW-129_021821
Date Collected: 02/18/21 11:20
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144705-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 15:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/26/21 15:50*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 17:36	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 17:36	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 17:36	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 17:36	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 17:36	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 17:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*02/26/21 17:36*	*1*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*		*02/26/21 17:36*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*02/26/21 17:36*	*1*
Dibromofluoromethane (Surr)	*102*		*78 - 129*		*02/26/21 17:36*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144705-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144705-1	TRIP BLANK	102	103	90	102
240-144705-2	MW-129S_021821	101	105	93	99
240-144705-3	MW-129_021821	101	103	93	102
240-144712-E-3 MS	Matrix Spike	92	103	94	93
240-144712-H-3 MSD	Matrix Spike Duplicate	93	103	94	94
LCS 240-474649/5	Lab Control Sample	93	103	93	94
MB 240-474649/8	Method Blank	101	103	91	103

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144705-2	MW-129S_021821	81
240-144705-3	MW-129_021821	81
240-144712-L-3 MS	Matrix Spike	80
240-144712-L-3 MSD	Matrix Spike Duplicate	81
LCS 240-474632/4	Lab Control Sample	80
MB 240-474632/5	Method Blank	80

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474649/8
Matrix: Water
Analysis Batch: 474649

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 12:15	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 12:15	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 12:15	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 12:15	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 12:15	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 12:15	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*02/26/21 12:15*	*1*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*		*02/26/21 12:15*	*1*
Toluene-d8 (Surr)	*91*		*69 - 122*		*02/26/21 12:15*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*02/26/21 12:15*	*1*

Lab Sample ID: LCS 240-474649/5
Matrix: Water
Analysis Batch: 474649

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	20.0	20.0		ug/L		100	73 - 129
cis-1,2-Dichloroethene	20.0	19.8		ug/L		99	75 - 124
Tetrachloroethene	20.0	19.2		ug/L		96	70 - 125
trans-1,2-Dichloroethene	20.0	19.5		ug/L		97	74 - 130
Trichloroethene	20.0	18.2		ug/L		91	71 - 121
Vinyl chloride	20.0	23.3		ug/L		116	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*94*		*78 - 129*

Lab Sample ID: 240-144712-E-3 MS
Matrix: Water
Analysis Batch: 474649

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	20.0	19.7		ug/L		99	64 - 132
cis-1,2-Dichloroethene	1.0	U	20.0	20.1		ug/L		100	68 - 121
Tetrachloroethene	1.0	U	20.0	19.0		ug/L		95	52 - 129
trans-1,2-Dichloroethene	1.0	U	20.0	19.7		ug/L		98	69 - 126
Trichloroethene	1.0	U	20.0	17.6		ug/L		88	56 - 124
Vinyl chloride	1.0	U	20.0	25.7		ug/L		129	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*
Toluene-d8 (Surr)	*94*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144712-E-3 MS
Matrix: Water
Analysis Batch: 474649

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	*93*		*78 - 129*

Lab Sample ID: 240-144712-H-3 MSD
Matrix: Water
Analysis Batch: 474649

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	20.0	20.7		ug/L		104	64 - 132	5	35
cis-1,2-Dichloroethene	1.0	U	20.0	21.0		ug/L		105	68 - 121	4	35
Tetrachloroethene	1.0	U	20.0	19.5		ug/L		97	52 - 129	2	35
trans-1,2-Dichloroethene	1.0	U	20.0	20.2		ug/L		101	69 - 126	3	35
Trichloroethene	1.0	U	20.0	19.0		ug/L		95	56 - 124	8	35
Vinyl chloride	1.0	U	20.0	25.1		ug/L		125	49 - 136	3	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*
Toluene-d8 (Surr)	*94*		*69 - 122*
Dibromofluoromethane (Surr)	*94*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474632/5
Matrix: Water
Analysis Batch: 474632

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 10:47	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/26/21 10:47*	*1*

Lab Sample ID: LCS 240-474632/4
Matrix: Water
Analysis Batch: 474632

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.5		ug/L		105	80 - 135

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*

Lab Sample ID: 240-144712-L-3 MS
Matrix: Water
Analysis Batch: 474632

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	10.2		ug/L		102	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*

Lab Sample ID: 240-144712-L-3 MSD
Matrix: Water
Analysis Batch: 474632

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.2		ug/L		102	46 - 170	0	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144705-1

GC/MS VOA

Analysis Batch: 474632

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144705-2	MW-129S_021821	Total/NA	Water	8260B SIM	
240-144705-3	MW-129_021821	Total/NA	Water	8260B SIM	
MB 240-474632/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474632/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144712-L-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144712-L-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474649

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144705-1	TRIP BLANK	Total/NA	Water	8260B	
240-144705-2	MW-129S_021821	Total/NA	Water	8260B	
240-144705-3	MW-129_021821	Total/NA	Water	8260B	
MB 240-474649/8	Method Blank	Total/NA	Water	8260B	
LCS 240-474649/5	Lab Control Sample	Total/NA	Water	8260B	
240-144712-E-3 MS	Matrix Spike	Total/NA	Water	8260B	
240-144712-H-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144705-1

Client Sample ID: TRIP BLANK
Date Collected: 02/18/21 00:00
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144705-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474649	02/26/21 16:47	HMB	TAL CAN

Client Sample ID: MW-129S_021821
Date Collected: 02/18/21 09:50
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144705-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474649	02/26/21 17:12	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		1	474632	02/26/21 15:25	SAM	TAL CAN

Client Sample ID: MW-129_021821
Date Collected: 02/18/21 11:20
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144705-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474649	02/26/21 17:36	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		1	474632	02/26/21 15:50	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144705-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

TestAmerica MICHIGAN 190

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client; Lab sampling; Job/SDG No:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			
Project Number: 30050315.402.04	Shipping/Tracking No:			
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-129S_021821	2/18/21	950		6						6					N	G	X	X	X	X	X	X	X	3 vocs for 8260B 3 vocs for 8260B SIM
MW-129_021821	2/18/21	1120		6						6					N	G	X	X	X	X	X	X	X	

240-144705 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by: Emma Witherspoon	Arcadis	2/18/21 1600	Novi gold storage	Arcadis	2/18/21 1600
Relinquished by:	Arcadis	2/19/21 10:11	Received by:	ETA	2/19/21 10:11
Relinquished by:	ETA	2/19/21 14:33	Received in Laboratory by:	TA	2-20-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 144705
Canton Facility

Client Arcadis Site Name

Cooler Received on 2-20-21 Opened on 2-20-21

Cooler unpacked by:

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.6 °C Corrected Cooler Temp. 1.7 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
   -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? Yes No
11. Sufficient quantity received to perform indicated analyses? Yes No
12. Are these work share samples and all listed on the COC? Yes No
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC907861
14. Were VOAs on the COC? Yes No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #____ Yes No
17. Was a LL Hg or Me Hg trip blank present? ____ Yes No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

March 08, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144705-1
Sample date: 2021-02-18
Report received by CADENA: 2021-03-08
Initial Data Verification completed by CADENA: 2021-03-08
Number of Samples:3
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144705-1

		Sample Name:	TRIP BLANK				MW-129S_021821				MW-129_021821			
		Lab Sample ID:	2401447051				2401447052				2401447053			
		Sample Date:	2/18/2021				2/18/2021				2/18/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC													
OSW-8260B													
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim													
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

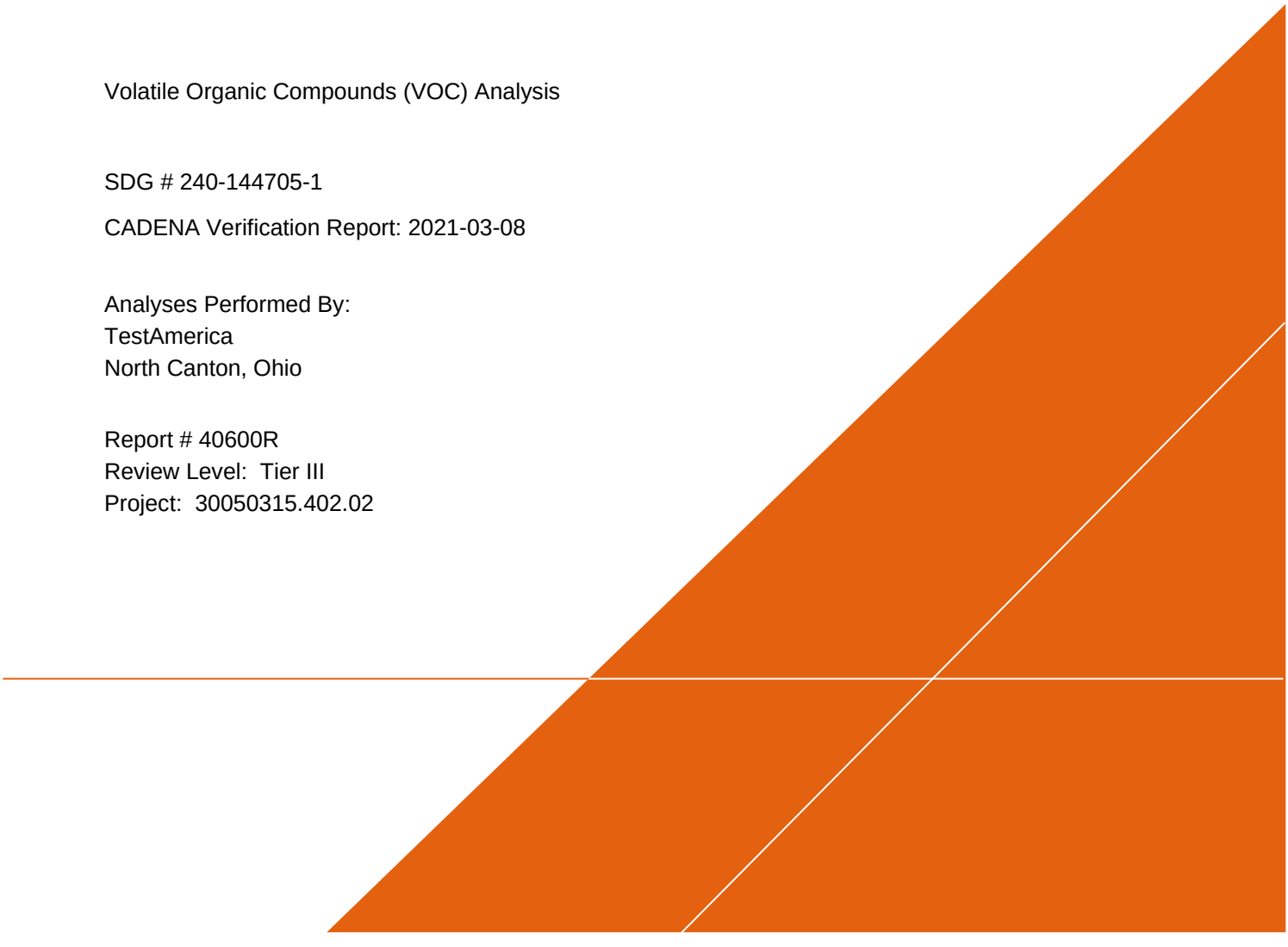
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144705-1

CADENA Verification Report: 2021-03-08

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40600R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144705-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144705-1	Water	02/18/2021		X	
MW-129S_021821	240-144705-2	Water	02/18/2021		X	X
MW-129_021821	240-144705-3	Water	02/18/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

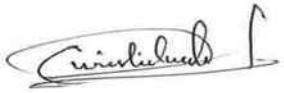
%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 17, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 18, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica MICHIGAN 190

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-129S_021821	2/18/21	950		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B; 3 VOAs for 8260B SIM
MW-129_021821	2/18/21	1120		6						6					N	G	X	X	X	X	X	X	X	

240-144705 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Emma Witherspoon	Arcadis	2/18/21 1600	Novi gold storage	Arcadis	2/18/21 1600
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[illegible]	Arcadis	2/19/21 10:11	Amanda Battershell	ETA	2/19/21 10:11
Relinquished by: Amanda Battershell	Company: ETA	Date/Time: 2/19/21 14:33	Received in Laboratory by:	Company: TA	Date/Time: 2-20-21 800

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144705-1
Date Collected: 02/18/21 00:00
Matrix: Water
Date Received: 02/20/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 16:47	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 16:47	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 16:47	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 16:47	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 16:47	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 16:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*75 - 130*		*02/26/21 16:47*	*1*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*		*02/26/21 16:47*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*02/26/21 16:47*	*1*
Dibromofluoromethane (Surr)	*102*		*78 - 129*		*02/26/21 16:47*	*1*

Client Sample ID: MW-129S_021821
Lab Sample ID: 240-144705-2
Date Collected: 02/18/21 09:50
Matrix: Water
Date Received: 02/20/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 15:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/26/21 15:25*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 17:12	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 17:12	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 17:12	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 17:12	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 17:12	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 17:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*02/26/21 17:12*	*1*
4-Bromofluorobenzene (Surr)	*105*		*47 - 134*		*02/26/21 17:12*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*02/26/21 17:12*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*02/26/21 17:12*	*1*

Client Sample ID: MW-129_021821
Lab Sample ID: 240-144705-3
Date Collected: 02/18/21 11:20
Matrix: Water
Date Received: 02/20/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 15:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/26/21 15:50*	*1*

Client Sample ID: MW-129_021821
Lab Sample ID: 240-144705-3
Date Collected: 02/18/21 11:20
Matrix: Water
Date Received: 02/20/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 17:36	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 17:36	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 17:36	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 17:36	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 17:36	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 17:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*02/26/21 17:36*	*1*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*		*02/26/21 17:36*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*02/26/21 17:36*	*1*
Dibromofluoromethane (Surr)	*102*		*78 - 129*		*02/26/21 17:36*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144443-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
2/24/2021 11:27:50 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144443-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
F1	MS and/or MSD recovery exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144443-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144443-1

Comments
No additional comments.

Receipt
The samples were received on 2/12/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.3º C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) associated with batch 473553 recovered above the upper control limit for 1,1-Dichloroethene. The samples associated with this CCV were non-detect for the affected analyte; therefore, the data have been reported. The associated samples are impacted: TRIP BLANK (240-144443-1), MW-75SR_021021 (240-144443-2), MW-75D_021021 (240-144443-3), DUP-11 (240-144443-4), MW-72_021021 (240-144443-5) and MW-72S_021021 (240-144443-6).

Method 8260B: The laboratory control sample (LCS) for 473553 recovered outside control limits for the following analyte: 1,1-Dichloroethene. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported: TRIP BLANK (240-144443-1), MW-75SR_021021 (240-144443-2), MW-75D_021021 (240-144443-3), DUP-11 (240-144443-4), MW-72_021021 (240-144443-5), MW-72S_021021 (240-144443-6) and (LCS 240-473553/4).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144443-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144443-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144443-1	TRIP BLANK	Water	02/10/21 00:00	02/12/21 08:00	
240-144443-2	MW-75SR_021021	Water	02/10/21 10:00	02/12/21 08:00	
240-144443-3	MW-75D_021021	Water	02/10/21 11:30	02/12/21 08:00	
240-144443-4	DUP-11	Water	02/10/21 00:00	02/12/21 08:00	
240-144443-5	MW-72_021021	Water	02/10/21 13:10	02/12/21 08:00	
240-144443-6	MW-72S_021021	Water	02/10/21 14:45	02/12/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144443-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144443-1

No Detections.

Client Sample ID: MW-75SR_021021 — Lab Sample ID: 240-144443-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	0.36	J	1.0	0.20	ug/L	1		8260B	Total/NA

Client Sample ID: MW-75D_021021 — Lab Sample ID: 240-144443-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	2.5		2.0	0.86	ug/L	1		8260B SIM	Total/NA
Vinyl chloride	1.1		1.0	0.20	ug/L	1		8260B	Total/NA

Client Sample ID: DUP-11 — Lab Sample ID: 240-144443-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	2.5		2.0	0.86	ug/L	1		8260B SIM	Total/NA
Vinyl chloride	1.1		1.0	0.20	ug/L	1		8260B	Total/NA

Client Sample ID: MW-72_021021 — Lab Sample ID: 240-144443-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	1.2		1.0	0.20	ug/L	1		8260B	Total/NA

Client Sample ID: MW-72S_021021 — Lab Sample ID: 240-144443-6

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144443-1

Client Sample ID: TRIP BLANK

Date Collected: 02/10/21 00:00
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144443-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/18/21 16:14	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/18/21 16:14	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/18/21 16:14	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 16:14	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/18/21 16:14	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/18/21 16:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*121*		*75 - 130*		*02/18/21 16:14*	*1*
4-Bromofluorobenzene (Surr)	*80*		*47 - 134*		*02/18/21 16:14*	*1*
Toluene-d8 (Surr)	*86*		*69 - 122*		*02/18/21 16:14*	*1*
Dibromofluoromethane (Surr)	*107*		*78 - 129*		*02/18/21 16:14*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144443-1

Client Sample ID: MW-75SR_021021
Date Collected: 02/10/21 10:00
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144443-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 14:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/18/21 14:58*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/18/21 16:35	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/18/21 16:35	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/18/21 16:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 16:35	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/18/21 16:35	1
Vinyl chloride	**0.36**	**J**	1.0	0.20	ug/L			02/18/21 16:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*125*		*75 - 130*		*02/18/21 16:35*	*1*
4-Bromofluorobenzene (Surr)	*80*		*47 - 134*		*02/18/21 16:35*	*1*
Toluene-d8 (Surr)	*87*		*69 - 122*		*02/18/21 16:35*	*1*
Dibromofluoromethane (Surr)	*110*		*78 - 129*		*02/18/21 16:35*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144443-1

Client Sample ID: MW-75D_021021

Date Collected: 02/10/21 11:30
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144443-3

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**2.5**		2.0	0.86	ug/L			02/18/21 15:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/18/21 15:23*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/18/21 16:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/18/21 16:57	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/18/21 16:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 16:57	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/18/21 16:57	1
Vinyl chloride	**1.1**		1.0	0.20	ug/L			02/18/21 16:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*126*		*75 - 130*		*02/18/21 16:57*	*1*
4-Bromofluorobenzene (Surr)	*81*		*47 - 134*		*02/18/21 16:57*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*02/18/21 16:57*	*1*
Dibromofluoromethane (Surr)	*110*		*78 - 129*		*02/18/21 16:57*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144443-1

Client Sample ID: DUP-11
Date Collected: 02/10/21 00:00
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144443-4
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.5		2.0	0.86	ug/L			02/18/21 15:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/18/21 15:49*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/18/21 17:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/18/21 17:19	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/18/21 17:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 17:19	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/18/21 17:19	1
Vinyl chloride	1.1		1.0	0.20	ug/L			02/18/21 17:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*125*		*75 - 130*		*02/18/21 17:19*	*1*
4-Bromofluorobenzene (Surr)	*82*		*47 - 134*		*02/18/21 17:19*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*02/18/21 17:19*	*1*
Dibromofluoromethane (Surr)	*112*		*78 - 129*		*02/18/21 17:19*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144443-1

Client Sample ID: MW-72_021021

Date Collected: 02/10/21 13:10
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144443-5

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 16:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/18/21 16:14*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/18/21 17:41	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/18/21 17:41	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/18/21 17:41	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 17:41	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/18/21 17:41	1
Vinyl chloride	**1.2**		1.0	0.20	ug/L			02/18/21 17:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*127*		*75 - 130*		*02/18/21 17:41*	*1*
4-Bromofluorobenzene (Surr)	*78*		*47 - 134*		*02/18/21 17:41*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*02/18/21 17:41*	*1*
Dibromofluoromethane (Surr)	*113*		*78 - 129*		*02/18/21 17:41*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144443-1

Client Sample ID: MW-72S_021021
Date Collected: 02/10/21 14:45
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144443-6
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 16:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/18/21 16:39*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/18/21 18:03	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/18/21 18:03	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/18/21 18:03	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 18:03	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/18/21 18:03	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/18/21 18:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*126*		*75 - 130*		*02/18/21 18:03*	*1*
4-Bromofluorobenzene (Surr)	*78*		*47 - 134*		*02/18/21 18:03*	*1*
Toluene-d8 (Surr)	*86*		*69 - 122*		*02/18/21 18:03*	*1*
Dibromofluoromethane (Surr)	*113*		*78 - 129*		*02/18/21 18:03*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144443-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144443-1	TRIP BLANK	121	80	86	107
240-144443-2	MW-75SR_021021	125	80	87	110
240-144443-3	MW-75D_021021	126	81	90	110
240-144443-4	DUP-11	125	82	90	112
240-144443-5	MW-72_021021	127	78	90	113
240-144443-6	MW-72S_021021	126	78	86	113
240-144460-B-2 MS	Matrix Spike	111	110	100	102
240-144460-B-2 MSD	Matrix Spike Duplicate	104	107	99	95
LCS 240-473553/4	Lab Control Sample	105	107	96	95
MB 240-473553/7	Method Blank	116	86	91	101

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144425-C-2 MS	Matrix Spike	82
240-144425-C-2 MSD	Matrix Spike Duplicate	81
240-144443-2	MW-75SR_021021	81
240-144443-3	MW-75D_021021	82
240-144443-4	DUP-11	83
240-144443-5	MW-72_021021	83
240-144443-6	MW-72S_021021	82
LCS 240-473604/4	Lab Control Sample	81
MB 240-473604/5	Method Blank	80

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473553/7
Matrix: Water
Analysis Batch: 473553

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 12:13	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/18/21 12:13	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/18/21 12:13	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 12:13	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/18/21 12:13	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/18/21 12:13	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*75 - 130*		*02/18/21 12:13*	*1*
4-Bromofluorobenzene (Surr)	*86*		*47 - 134*		*02/18/21 12:13*	*1*
Toluene-d8 (Surr)	*91*		*69 - 122*		*02/18/21 12:13*	*1*
Dibromofluoromethane (Surr)	*101*		*78 - 129*		*02/18/21 12:13*	*1*

Lab Sample ID: LCS 240-473553/4
Matrix: Water
Analysis Batch: 473553

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	17.3	*+	ug/L		173	73 - 129
cis-1,2-Dichloroethene	10.0	9.52		ug/L		95	75 - 124
Tetrachloroethene	10.0	9.34		ug/L		93	70 - 125
trans-1,2-Dichloroethene	10.0	9.59		ug/L		96	74 - 130
Trichloroethene	10.0	9.06		ug/L		91	71 - 121
Vinyl chloride	10.0	8.30		ug/L		83	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*105*		*75 - 130*
4-Bromofluorobenzene (Surr)	*107*		*47 - 134*
Toluene-d8 (Surr)	*96*		*69 - 122*
Dibromofluoromethane (Surr)	*95*		*78 - 129*

Lab Sample ID: 240-144460-B-2 MS
Matrix: Water
Analysis Batch: 473553

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	2500	U F1 *+	25000	35500	F1	ug/L		142	64 - 132
cis-1,2-Dichloroethene	2900		25000	25500		ug/L		91	68 - 121
Tetrachloroethene	2500	U	25000	21400		ug/L		86	52 - 129
Trichloroethene	50000		25000	65000		ug/L		59	56 - 124
Vinyl chloride	2500	U	25000	15800		ug/L		63	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*111*		*75 - 130*
4-Bromofluorobenzene (Surr)	*110*		*47 - 134*
Toluene-d8 (Surr)	*100*		*69 - 122*
Dibromofluoromethane (Surr)	*102*		*78 - 129*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144460-B-2 MSD
Matrix: Water
Analysis Batch: 473553

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	2500	U F1 *+	25000	38200	F1	ug/L		153	64 - 132	7	35
cis-1,2-Dichloroethene	2900		25000	26200		ug/L		93	68 - 121	2	35
Tetrachloroethene	2500	U	25000	24000		ug/L		96	52 - 129	12	35
Trichloroethene	50000		25000	65000		ug/L		59	56 - 124	0	35
Vinyl chloride	2500	U	25000	18200		ug/L		73	49 - 136	14	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*
4-Bromofluorobenzene (Surr)	*107*		*47 - 134*
Toluene-d8 (Surr)	*99*		*69 - 122*
Dibromofluoromethane (Surr)	*95*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473604/5
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 12:27	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/18/21 12:27*	*1*

Lab Sample ID: LCS 240-473604/4
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.5		ug/L		105	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

Lab Sample ID: 240-144425-C-2 MS
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	11.1		ug/L		111	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144425-C-2 MSD
Matrix: Water
Analysis Batch: 473604

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.7		ug/L		107	46 - 170	3	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144443-1

GC/MS VOA

Analysis Batch: 473553

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144443-1	TRIP BLANK	Total/NA	Water	8260B	
240-144443-2	MW-75SR_021021	Total/NA	Water	8260B	
240-144443-3	MW-75D_021021	Total/NA	Water	8260B	
240-144443-4	DUP-11	Total/NA	Water	8260B	
240-144443-5	MW-72_021021	Total/NA	Water	8260B	
240-144443-6	MW-72S_021021	Total/NA	Water	8260B	
MB 240-473553/7	Method Blank	Total/NA	Water	8260B	
LCS 240-473553/4	Lab Control Sample	Total/NA	Water	8260B	
240-144460-B-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144460-B-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 473604

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144443-2	MW-75SR_021021	Total/NA	Water	8260B SIM	
240-144443-3	MW-75D_021021	Total/NA	Water	8260B SIM	
240-144443-4	DUP-11	Total/NA	Water	8260B SIM	
240-144443-5	MW-72_021021	Total/NA	Water	8260B SIM	
240-144443-6	MW-72S_021021	Total/NA	Water	8260B SIM	
MB 240-473604/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-473604/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144425-C-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144425-C-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144443-1

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144443-1
Date Collected: 02/10/21 00:00
Matrix: Water
Date Received: 02/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473553	02/18/21 16:14	LEE	TAL CAN

Client Sample ID: MW-75SR_021021
Lab Sample ID: 240-144443-2
Date Collected: 02/10/21 10:00
Matrix: Water
Date Received: 02/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473553	02/18/21 16:35	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	473604	02/18/21 14:58	SAM	TAL CAN

Client Sample ID: MW-75D_021021
Lab Sample ID: 240-144443-3
Date Collected: 02/10/21 11:30
Matrix: Water
Date Received: 02/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473553	02/18/21 16:57	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	473604	02/18/21 15:23	SAM	TAL CAN

Client Sample ID: DUP-11
Lab Sample ID: 240-144443-4
Date Collected: 02/10/21 00:00
Matrix: Water
Date Received: 02/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473553	02/18/21 17:19	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	473604	02/18/21 15:49	SAM	TAL CAN

Client Sample ID: MW-72_021021
Lab Sample ID: 240-144443-5
Date Collected: 02/10/21 13:10
Matrix: Water
Date Received: 02/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473553	02/18/21 17:41	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	473604	02/18/21 16:14	SAM	TAL CAN

Client Sample ID: MW-72S_021021
Lab Sample ID: 240-144443-6
Date Collected: 02/10/21 14:45
Matrix: Water
Date Received: 02/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473553	02/18/21 18:03	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	473604	02/18/21 16:39	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144443-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

MICHIGAN 190 TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Allyson Hartz		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

COC No:

1 of 1 COCs

For lab use only: Walk-in client / Lab sampling / Job/SDG No:

Analysis Turnaround Time: TAT if different from below — 10 day: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-75SR_021021	2/10/21	10:00		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-75D_021021	2/10/21	11:30		6						6					N	G	X	X	X	X	X	X	X	
DUP-11	2/10/21	—		6						6					N	G	X	X	X	X	X	X	X	
MW-72_021021	2/10/21	13:10		6						6					N	G	X	X	X	X	X	X	X	
MW-72S_021021	2/10/21	14:45		6						6					N	G	X	X	X	X	X	X	X	

240-144443 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ...

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalla@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	2/10/21 16:00	Novi cold storage	Arcadis	2/10/21 16:00
[signature]	ARCADIS	2/11/21 / 0953	[signature]	ETA	2/11/21 0953
			Received in Laboratory by: [signature]	ETA	2-12-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 144443**
Canton Facility

Client Aradis Site Name

Cooler Received on 2-12-21 Opened on 2-12-21 800

Cooler unpacked by: Ryan C

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 3	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No RNC 2-12-21
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC907861
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 59072	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT



February 24, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144443-1
Sample date: 2021-02-10
Report received by CADENA: 2021-02-24
Initial Data Verification completed by CADENA: 2021-02-24
Number of Samples:6
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 473553 LCS recoveries were outliers biased high for the following analyte: 1,1-DICHLOROETHENE. Associated client sample results were non-detect so qualification was not required based on this high bias QC outlier.

GCMS VOC QC batch MS/MSD recovery outliers were not determined using a client sample so qualification was not required based on these sample-specific QC outliers.

GCMS VOC QC batch CCV response outliers as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144443-1

	Sample Name:	TRIP BLANK				MW-75SR_021021				MW-75D_021021				DUP-11				MW-72_021021				MW-72S_021021			
	Lab Sample ID:	2401444431				2401444432				2401444433				2401444434				2401444435				2401444436			
	Sample Date:	2/10/2021				2/10/2021				2/10/2021				2/10/2021				2/10/2021				2/10/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC																									
OSW-8260B																									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	0.36	1.0	ug/l	J	1.1	1.0	ug/l	---	1.1	1.0	ug/l	---	1.2	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim																									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	2.5	2.0	ug/l	---	2.5	2.0	ug/l	---	ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

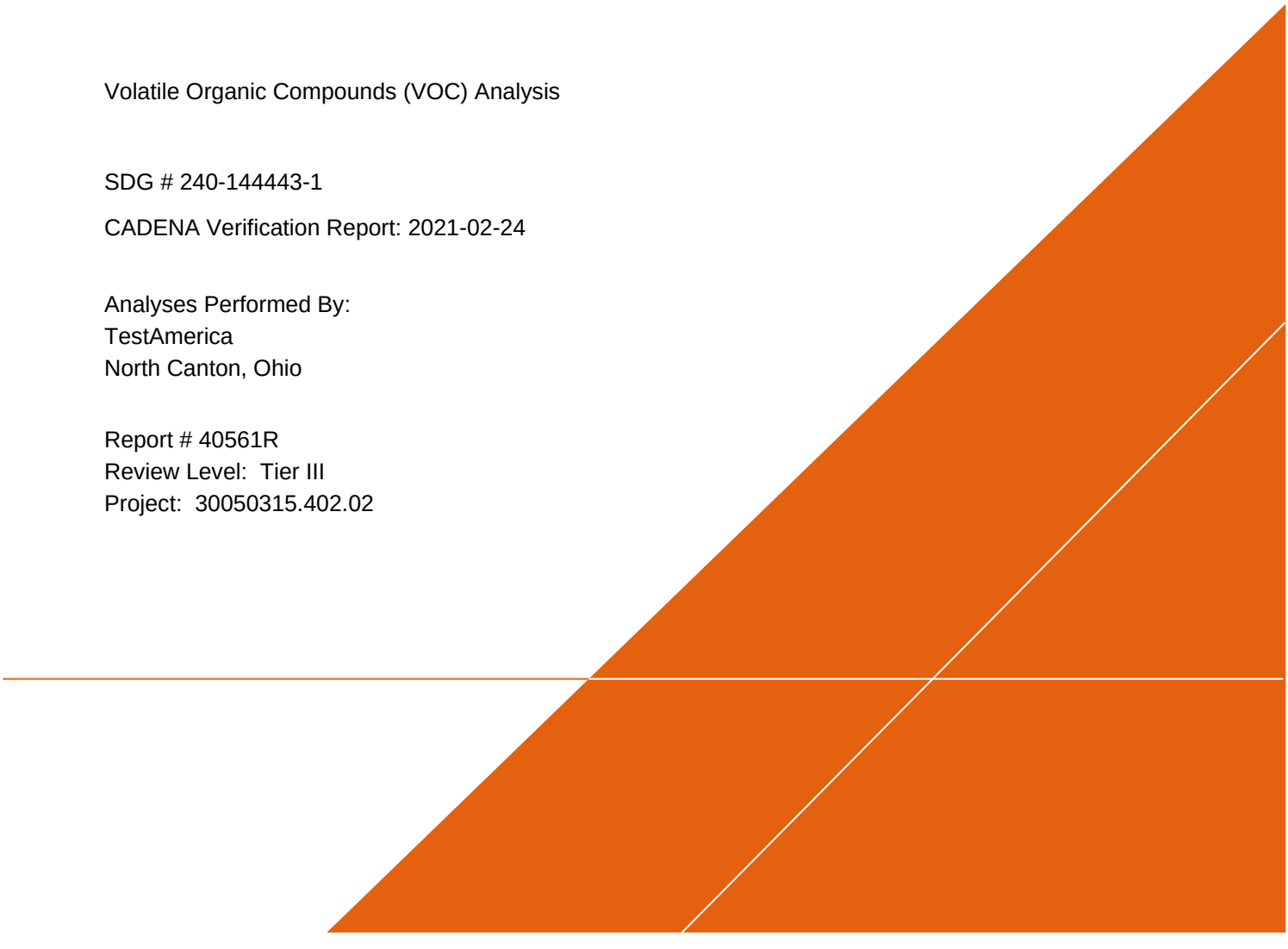
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144443-1

CADENA Verification Report: 2021-02-24

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40561R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144443-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144443-1	Water	02/10/2021		X	
MW-75SR_021021	240-144443-2	Water	02/10/2021		X	X
MW-75D_021021	240-144443-3	Water	02/10/2021		X	X
DUP-11	240-144443-4	Water	02/10/2021	MW-75D_021021	X	X
MW-72_021021	240-144443-5	Water	02/10/2021		X	X
MW-72S_021021	240-144443-6	Water	02/10/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial/Continuing	Compound	Criteria
TRIP BLANK MW-75SR_021021 MW-75D_021021 DUP-08 MW-72_021021 MW-72S_021021	CCV %D	1,1-Dichloroethene	+47.8%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
	RRF <0.05	Non-detect	R

DATA REVIEW

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1] RRF of 0.01 only applies to compounds which are typically poor responding compounds (i.e., ketones, 1,4-dioxane, etc.)

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result (µg/L)	Duplicate Result (µg/L)	RPD
MW-75D_021021 / DUP-11	1,4-Dioxane	2.5	2.5	AC
	Vinyl chloride	1.1	1.1	AC

Notes:

AC – Acceptable

DATA REVIEW

The calculated differences between the parent sample and field duplicate were acceptable.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

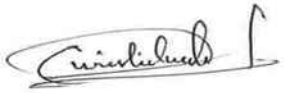
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 17, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190 — TestAmerica — THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No: 1 of 1 COCs
Phone: 248-994-2240	Sampler Name: Allyson Hartz	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day (10 day)	For lab use only: Walk-in client; Lab sampling; Job/SDG No:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-75SR_021021	2/10/21	10:00		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B; 3 VOAs for 8260B SIM
MW-75D_021021	2/10/21	11:30		6						6					N	G	X	X	X	X	X	X	X	
DUP-11	2/10/21	—		6						6					N	G	X	X	X	X	X	X	X	
MW-72_021021	2/10/21	13:10		6						6					N	G	X	X	X	X	X	X	X	
MW-725_021021	2/10/21	14:45		6						6					N	G	X	X	X	X	X	X	X	

240-144443 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalla@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Allyson Hartz	Arcadis	2/10/21 16:00	Novi Cold Storage	Arcadis	2/10/21 16:00
Christian Uhler	Arcadis	2/11/21 / 0953	Amanda Kitchen	ETA	2/11/21 0953
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
			[illegible]	ETA	2-12-21 800

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Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144443-1

Date Collected: 02/10/21 00:00
Matrix: Water
Date Received: 02/12/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 16:14	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/18/21 16:14	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/18/21 16:14	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 16:14	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/18/21 16:14	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/18/21 16:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*121*		*75 - 130*		*02/18/21 16:14*	*1*
4-Bromofluorobenzene (Surr)	*80*		*47 - 134*		*02/18/21 16:14*	*1*
Toluene-d8 (Surr)	*86*		*69 - 122*		*02/18/21 16:14*	*1*
Dibromofluoromethane (Surr)	*107*		*78 - 129*		*02/18/21 16:14*	*1*

Client Sample ID: MW-75SR_021021

Lab Sample ID: 240-144443-2

Date Collected: 02/10/21 10:00
Matrix: Water
Date Received: 02/12/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 14:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/18/21 14:58*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 16:35	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/18/21 16:35	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/18/21 16:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 16:35	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/18/21 16:35	1
Vinyl chloride	**0.36**	**J**	1.0	0.20	ug/L			02/18/21 16:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*125*		*75 - 130*		*02/18/21 16:35*	*1*
4-Bromofluorobenzene (Surr)	*80*		*47 - 134*		*02/18/21 16:35*	*1*
Toluene-d8 (Surr)	*87*		*69 - 122*		*02/18/21 16:35*	*1*
Dibromofluoromethane (Surr)	*110*		*78 - 129*		*02/18/21 16:35*	*1*

Client Sample ID: MW-75D_021021

Lab Sample ID: 240-144443-3

Date Collected: 02/10/21 11:30
Matrix: Water
Date Received: 02/12/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**2.5**		2.0	0.86	ug/L			02/18/21 15:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/18/21 15:23*	*1*

Client Sample ID: MW-75D_021021

Lab Sample ID: 240-144443-3

Date Collected: 02/10/21 11:30
Matrix: Water
Date Received: 02/12/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/18/21 16:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/18/21 16:57	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/18/21 16:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 16:57	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/18/21 16:57	1
Vinyl chloride	**1.1**		1.0	0.20	ug/L			02/18/21 16:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*126*		*75 - 130*		*02/18/21 16:57*	*1*
4-Bromofluorobenzene (Surr)	*81*		*47 - 134*		*02/18/21 16:57*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*02/18/21 16:57*	*1*
Dibromofluoromethane (Surr)	*110*		*78 - 129*		*02/18/21 16:57*	*1*

Client Sample ID: DUP-11

Lab Sample ID: 240-144443-4

Date Collected: 02/10/21 00:00
Matrix: Water
Date Received: 02/12/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**2.5**		2.0	0.86	ug/L			02/18/21 15:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/18/21 15:49*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/18/21 17:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/18/21 17:19	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/18/21 17:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 17:19	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/18/21 17:19	1
Vinyl chloride	**1.1**		1.0	0.20	ug/L			02/18/21 17:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*125*		*75 - 130*		*02/18/21 17:19*	*1*
4-Bromofluorobenzene (Surr)	*82*		*47 - 134*		*02/18/21 17:19*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*02/18/21 17:19*	*1*
Dibromofluoromethane (Surr)	*112*		*78 - 129*		*02/18/21 17:19*	*1*

Client Sample ID: MW-72_021021

Lab Sample ID: 240-144443-5

Date Collected: 02/10/21 13:10
Matrix: Water
Date Received: 02/12/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 16:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/18/21 16:14*	*1*

Client Sample ID: MW-72_021021
Lab Sample ID: 240-144443-5
Date Collected: 02/10/21 13:10
Matrix: Water
Date Received: 02/12/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/18/21 17:41	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/18/21 17:41	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/18/21 17:41	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 17:41	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/18/21 17:41	1
Vinyl chloride	**1.2**		1.0	0.20	ug/L			02/18/21 17:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*127*		*75 - 130*		*02/18/21 17:41*	*1*
4-Bromofluorobenzene (Surr)	*78*		*47 - 134*		*02/18/21 17:41*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*02/18/21 17:41*	*1*
Dibromofluoromethane (Surr)	*113*		*78 - 129*		*02/18/21 17:41*	*1*

Client Sample ID: MW-72S_021021
Lab Sample ID: 240-144443-6
Date Collected: 02/10/21 14:45
Matrix: Water
Date Received: 02/12/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/18/21 16:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/18/21 16:39*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/18/21 18:03	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/18/21 18:03	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/18/21 18:03	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 18:03	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/18/21 18:03	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/18/21 18:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*126*		*75 - 130*		*02/18/21 18:03*	*1*
4-Bromofluorobenzene (Surr)	*78*		*47 - 134*		*02/18/21 18:03*	*1*
Toluene-d8 (Surr)	*86*		*69 - 122*		*02/18/21 18:03*	*1*
Dibromofluoromethane (Surr)	*113*		*78 - 129*		*02/18/21 18:03*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144512-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
2/24/2021 11:48:20 AM

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Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144512-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144512-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144512-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144512-1	TRIP BLANK	Water	02/11/21 00:00	02/13/21 08:00	
240-144512-2	MW-73SR_021121	Water	02/11/21 10:17	02/13/21 08:00	
240-144512-3	MW-73D_021121	Water	02/11/21 11:57	02/13/21 08:00	
240-144512-4	MW-74_021121	Water	02/11/21 13:57	02/13/21 08:00	
240-144512-5	DUP-09	Water	02/11/21 00:00	02/13/21 08:00	
240-144512-6	MW-74S_021121	Water	02/11/21 15:32	02/13/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144512-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144512-1

No Detections.

Client Sample ID: MW-73SR_021121 — Lab Sample ID: 240-144512-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	1.5		1.0	0.16	ug/L	1		8260B	Total/NA
Trichloroethene	0.17	J	1.0	0.10	ug/L	1		8260B	Total/NA
Vinyl chloride	0.55	J	1.0	0.20	ug/L	1		8260B	Total/NA

Client Sample ID: MW-73D_021121 — Lab Sample ID: 240-144512-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	1.5	J	2.0	0.86	ug/L	1		8260B SIM	Total/NA

Client Sample ID: MW-74_021121 — Lab Sample ID: 240-144512-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	2.1		2.0	0.86	ug/L	1		8260B SIM	Total/NA
cis-1,2-Dichloroethene	0.33	J	1.0	0.16	ug/L	1		8260B	Total/NA
Vinyl chloride	3.1		1.0	0.20	ug/L	1		8260B	Total/NA

Client Sample ID: DUP-09 — Lab Sample ID: 240-144512-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	2.0		2.0	0.86	ug/L	1		8260B SIM	Total/NA
cis-1,2-Dichloroethene	0.32	J	1.0	0.16	ug/L	1		8260B	Total/NA
Vinyl chloride	3.2		1.0	0.20	ug/L	1		8260B	Total/NA

Client Sample ID: MW-74S_021121 — Lab Sample ID: 240-144512-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	0.84	J	1.0	0.16	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144512-1

Client Sample ID: TRIP BLANK
Date Collected: 02/11/21 00:00
Date Received: 02/13/21 08:00

Lab Sample ID: 240-144512-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 13:40	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 13:40	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 13:40	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 13:40	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 13:40	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/22/21 13:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*02/22/21 13:40*	*1*
4-Bromofluorobenzene (Surr)	*111*		*47 - 134*		*02/22/21 13:40*	*1*
Toluene-d8 (Surr)	*104*		*69 - 122*		*02/22/21 13:40*	*1*
Dibromofluoromethane (Surr)	*95*		*78 - 129*		*02/22/21 13:40*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144512-1

Client Sample ID: MW-73SR_021121
Date Collected: 02/11/21 10:17
Date Received: 02/13/21 08:00

Lab Sample ID: 240-144512-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/19/21 14:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/19/21 14:56*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 14:03	1
cis-1,2-Dichloroethene	**1.5**		1.0	0.16	ug/L			02/22/21 14:03	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 14:03	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 14:03	1
Trichloroethene	**0.17**	**J**	1.0	0.10	ug/L			02/22/21 14:03	1
Vinyl chloride	**0.55**	**J**	1.0	0.20	ug/L			02/22/21 14:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*75 - 130*		*02/22/21 14:03*	*1*
4-Bromofluorobenzene (Surr)	*113*		*47 - 134*		*02/22/21 14:03*	*1*
Toluene-d8 (Surr)	*107*		*69 - 122*		*02/22/21 14:03*	*1*
Dibromofluoromethane (Surr)	*94*		*78 - 129*		*02/22/21 14:03*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144512-1

Client Sample ID: MW-73D_021121

Date Collected: 02/11/21 11:57
Date Received: 02/13/21 08:00

Lab Sample ID: 240-144512-3

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	1.5	J	2.0	0.86	ug/L			02/19/21 15:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/19/21 15:21*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 14:26	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 14:26	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 14:26	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 14:26	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 14:26	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/22/21 14:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*107*		*75 - 130*		*02/22/21 14:26*	*1*
4-Bromofluorobenzene (Surr)	*115*		*47 - 134*		*02/22/21 14:26*	*1*
Toluene-d8 (Surr)	*108*		*69 - 122*		*02/22/21 14:26*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*02/22/21 14:26*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144512-1

Client Sample ID: MW-74_021121
Date Collected: 02/11/21 13:57
Date Received: 02/13/21 08:00

Lab Sample ID: 240-144512-4
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**2.1**		2.0	0.86	ug/L			02/19/21 15:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/19/21 15:47*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 14:48	1
cis-1,2-Dichloroethene	**0.33**	**J**	1.0	0.16	ug/L			02/22/21 14:48	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 14:48	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 14:48	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 14:48	1
Vinyl chloride	**3.1**		1.0	0.20	ug/L			02/22/21 14:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*75 - 130*		*02/22/21 14:48*	*1*
4-Bromofluorobenzene (Surr)	*117*		*47 - 134*		*02/22/21 14:48*	*1*
Toluene-d8 (Surr)	*108*		*69 - 122*		*02/22/21 14:48*	*1*
Dibromofluoromethane (Surr)	*97*		*78 - 129*		*02/22/21 14:48*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144512-1

Client Sample ID: DUP-09
Date Collected: 02/11/21 00:00
Date Received: 02/13/21 08:00

Lab Sample ID: 240-144512-5
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**2.0**		2.0	0.86	ug/L			02/19/21 16:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/19/21 16:12*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 15:11	1
cis-1,2-Dichloroethene	**0.32**	**J**	1.0	0.16	ug/L			02/22/21 15:11	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 15:11	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 15:11	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 15:11	1
Vinyl chloride	**3.2**		1.0	0.20	ug/L			02/22/21 15:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*75 - 130*		*02/22/21 15:11*	*1*
4-Bromofluorobenzene (Surr)	*113*		*47 - 134*		*02/22/21 15:11*	*1*
Toluene-d8 (Surr)	*108*		*69 - 122*		*02/22/21 15:11*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*02/22/21 15:11*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144512-1

Client Sample ID: MW-74S_021121
Date Collected: 02/11/21 15:32
Date Received: 02/13/21 08:00

Lab Sample ID: 240-144512-6
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/19/21 16:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*		*02/19/21 16:38*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 15:33	1
cis-1,2-Dichloroethene	**0.84**	**J**	1.0	0.16	ug/L			02/22/21 15:33	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 15:33	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 15:33	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 15:33	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/22/21 15:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*75 - 130*		*02/22/21 15:33*	*1*
4-Bromofluorobenzene (Surr)	*115*		*47 - 134*		*02/22/21 15:33*	*1*
Toluene-d8 (Surr)	*108*		*69 - 122*		*02/22/21 15:33*	*1*
Dibromofluoromethane (Surr)	*101*		*78 - 129*		*02/22/21 15:33*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144512-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144512-1	TRIP BLANK	100	111	104	95
240-144512-2	MW-73SR_021121	99	113	107	94
240-144512-3	MW-73D_021121	107	115	108	98
240-144512-4	MW-74_021121	105	117	108	97
240-144512-5	DUP-09	102	113	108	98
240-144512-6	MW-74S_021121	108	115	108	101
240-144515-D-3 MS	Matrix Spike	108	118	110	101
240-144515-E-3 MSD	Matrix Spike Duplicate	104	115	106	98
LCS 240-473923/5	Lab Control Sample	105	118	109	99
MB 240-473923/8	Method Blank	103	112	106	95

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144512-2	MW-73SR_021121	82
240-144512-3	MW-73D_021121	82
240-144512-4	MW-74_021121	81
240-144512-5	DUP-09	80
240-144512-6	MW-74S_021121	79
240-144515-J-3 MS	Matrix Spike	82
240-144515-J-3 MSD	Matrix Spike Duplicate	80
LCS 240-473720/4	Lab Control Sample	82
MB 240-473720/5	Method Blank	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473923/8
Matrix: Water
Analysis Batch: 473923

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 11:12	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 11:12	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 11:12	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 11:12	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 11:12	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/22/21 11:12	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*75 - 130*		*02/22/21 11:12*	*1*
4-Bromofluorobenzene (Surr)	*112*		*47 - 134*		*02/22/21 11:12*	*1*
Toluene-d8 (Surr)	*106*		*69 - 122*		*02/22/21 11:12*	*1*
Dibromofluoromethane (Surr)	*95*		*78 - 129*		*02/22/21 11:12*	*1*

Lab Sample ID: LCS 240-473923/5
Matrix: Water
Analysis Batch: 473923

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	20.0	18.8		ug/L		94	73 - 129
cis-1,2-Dichloroethene	20.0	17.6		ug/L		88	75 - 124
Tetrachloroethene	20.0	19.8		ug/L		99	70 - 125
trans-1,2-Dichloroethene	20.0	18.6		ug/L		93	74 - 130
Trichloroethene	20.0	18.8		ug/L		94	71 - 121
Vinyl chloride	20.0	19.9		ug/L		99	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*105*		*75 - 130*
4-Bromofluorobenzene (Surr)	*118*		*47 - 134*
Toluene-d8 (Surr)	*109*		*69 - 122*
Dibromofluoromethane (Surr)	*99*		*78 - 129*

Lab Sample ID: 240-144515-D-3 MS
Matrix: Water
Analysis Batch: 473923

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	20.0	19.1		ug/L		96	64 - 132
cis-1,2-Dichloroethene	1.0	U	20.0	18.1		ug/L		91	68 - 121
Tetrachloroethene	1.0	U	20.0	20.0		ug/L		100	52 - 129
trans-1,2-Dichloroethene	1.0	U	20.0	18.6		ug/L		93	69 - 126
Trichloroethene	1.0	U	20.0	18.8		ug/L		94	56 - 124
Vinyl chloride	1.0	U	20.0	17.9		ug/L		90	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*108*		*75 - 130*
4-Bromofluorobenzene (Surr)	*118*		*47 - 134*
Toluene-d8 (Surr)	*110*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144515-D-3 MS
Matrix: Water
Analysis Batch: 473923

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	101		78 - 129

Lab Sample ID: 240-144515-E-3 MSD
Matrix: Water
Analysis Batch: 473923

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	20.0	19.4		ug/L		97	64 - 132	1	35
cis-1,2-Dichloroethene	1.0	U	20.0	17.9		ug/L		89	68 - 121	1	35
Tetrachloroethene	1.0	U	20.0	19.6		ug/L		98	52 - 129	2	35
trans-1,2-Dichloroethene	1.0	U	20.0	18.5		ug/L		92	69 - 126	1	35
Trichloroethene	1.0	U	20.0	18.3		ug/L		92	56 - 124	2	35
Vinyl chloride	1.0	U	20.0	18.3		ug/L		92	49 - 136	2	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	104		75 - 130
4-Bromofluorobenzene (Surr)	115		47 - 134
Toluene-d8 (Surr)	106		69 - 122
Dibromofluoromethane (Surr)	98		78 - 129

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473720/5
Matrix: Water
Analysis Batch: 473720

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/19/21 11:08	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	81		70 - 133		02/19/21 11:08	1

Lab Sample ID: LCS 240-473720/4
Matrix: Water
Analysis Batch: 473720

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.95		ug/L		100	80 - 135

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	82		70 - 133

Lab Sample ID: 240-144515-J-3 MS
Matrix: Water
Analysis Batch: 473720

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	11.0		ug/L		110	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144515-J-3 MSD
Matrix: Water
Analysis Batch: 473720

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.6		ug/L		106	46 - 170	3	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*

GC/MS VOA

Analysis Batch: 473720

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144512-2	MW-73SR_021121	Total/NA	Water	8260B SIM	
240-144512-3	MW-73D_021121	Total/NA	Water	8260B SIM	
240-144512-4	MW-74_021121	Total/NA	Water	8260B SIM	
240-144512-5	DUP-09	Total/NA	Water	8260B SIM	
240-144512-6	MW-74S_021121	Total/NA	Water	8260B SIM	
MB 240-473720/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-473720/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144515-J-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144515-J-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 473923

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144512-1	TRIP BLANK	Total/NA	Water	8260B	
240-144512-2	MW-73SR_021121	Total/NA	Water	8260B	
240-144512-3	MW-73D_021121	Total/NA	Water	8260B	
240-144512-4	MW-74_021121	Total/NA	Water	8260B	
240-144512-5	DUP-09	Total/NA	Water	8260B	
240-144512-6	MW-74S_021121	Total/NA	Water	8260B	
MB 240-473923/8	Method Blank	Total/NA	Water	8260B	
LCS 240-473923/5	Lab Control Sample	Total/NA	Water	8260B	
240-144515-D-3 MS	Matrix Spike	Total/NA	Water	8260B	
240-144515-E-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144512-1

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144512-1
Date Collected: 02/11/21 00:00
Matrix: Water
Date Received: 02/13/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473923	02/22/21 13:40	HMB	TAL CAN

Client Sample ID: MW-73SR_021121
Lab Sample ID: 240-144512-2
Date Collected: 02/11/21 10:17
Matrix: Water
Date Received: 02/13/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473923	02/22/21 14:03	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		1	473720	02/19/21 14:56	SAM	TAL CAN

Client Sample ID: MW-73D_021121
Lab Sample ID: 240-144512-3
Date Collected: 02/11/21 11:57
Matrix: Water
Date Received: 02/13/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473923	02/22/21 14:26	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		1	473720	02/19/21 15:21	SAM	TAL CAN

Client Sample ID: MW-74_021121
Lab Sample ID: 240-144512-4
Date Collected: 02/11/21 13:57
Matrix: Water
Date Received: 02/13/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473923	02/22/21 14:48	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		1	473720	02/19/21 15:47	SAM	TAL CAN

Client Sample ID: DUP-09
Lab Sample ID: 240-144512-5
Date Collected: 02/11/21 00:00
Matrix: Water
Date Received: 02/13/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473923	02/22/21 15:11	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		1	473720	02/19/21 16:12	SAM	TAL CAN

Client Sample ID: MW-74S_021121
Lab Sample ID: 240-144512-6
Date Collected: 02/11/21 15:32
Matrix: Water
Date Received: 02/13/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473923	02/22/21 15:33	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		1	473720	02/19/21 16:38	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144512-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

MICHIGAN 190 TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No: / of / COCs
Phone: 248-994-2240	Sampler Name:	TAT if different from below: 10 day; ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day	For lab use only
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		Walk-in client
Project Number: 30050315.402.04	Shipping/Tracking No:		Lab sampling
PO # 30050315.402.04			Job/SDG No:

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 trip blank
MW-735R_021121	2/11/21	10:17		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-73D_021121	2/11/21	11:57		6						6					N	G	X	X	X	X	X	X	X	
MW-74_021121	2/11/21	13:57		6						6					N	G	X	X	X	X	X	X	X	
DUP-09	2/11/21	—		6						6					N	G	X	X	X	X	X	X	X	
MW-74S_021121	2/11/21	15:32		6						6					N	G	X	X	X	X	X	X	X	

240-144512 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com, Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	2/11/21 16:00	Emma Witherspoon	Arcadis	2/11/21 16:00
[signature]	Arcadis	2/11/21 1700	[signature] NOVI cold storage	Arcadis	2/11/21 1700
[signature]	Arcadis	2/12/2021	Received in Laboratory by: [signature] Amanda Battichel	Company: ETA	Date/Time: 10:05 2/12/21
Amanda Battichel	ETA	2/12/21 11:01	[signature]	ETA	2-13-21 800

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2/24/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 144512

Client Arcadis Site Name

Cooler unpacked by: Ryan C

Cooler Received on 2-13-21 Opened on 2-13-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: ~~Bubble Wrap~~ Foam Plastic Bag None Other

COOLANT: ~~Wet Ice~~ Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.4 °C Corrected Cooler Temp. 1.5 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	~~Yes~~	No
-Were the seals on the outside of the cooler(s) signed & dated?	~~Yes~~	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	~~No~~
-Were tamper/custody seals intact and uncompromised?	~~Yes~~	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	~~No~~
4. Did custody papers accompany the sample(s)?	~~Yes~~	No
5. Were the custody papers relinquished & signed in the appropriate place?	~~Yes~~	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	~~Yes~~	No
7. Did all bottles arrive in good condition (Unbroken)?	~~Yes~~	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	~~Yes~~	No
9. For each sample, does the COC specify preservatives (~~Y~~/N), # of containers (~~Y~~/N), and sample type of grab/comp(~~Y~~/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	~~Yes~~	No
11. Sufficient quantity received to perform indicated analyses?	~~Yes~~	No
12. Are these work share samples and all listed on the COC?	Yes	~~No~~
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No ~~NA~~ pH Strip Lot# HC907861
14. Were VOAs on the COC?	~~Yes~~	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	~~No~~ NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 59072	~~Yes~~	No
17. Was a LL Hg or Me Hg trip blank present?	Yes	~~No~~

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container.
Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.
Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

DATA VERIFICATION REPORT



February 24, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144512-1
Sample date: 2021-02-11
Report received by CADENA: 2021-02-24
Initial Data Verification completed by CADENA: 2021-02-24
Number of Samples:6
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144512-1

		Sample Name:	TRIP BLANK				MW-73SR_021121				MW-73D_021121				MW-74_021121				DUP-09				MW-74S_021121			
		Lab Sample ID:	2401445121				2401445122				2401445123				2401445124				2401445125				2401445126			
		Sample Date:	2/11/2021				2/11/2021				2/11/2021				2/11/2021				2/11/2021				2/11/2021			
Analyte	Cas No.		Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC																										
OSW-8260B																										
1,1-Dichloroethene	75-35-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2		ND	1.0	ug/l	---	1.5	1.0	ug/l	---	ND	1.0	ug/l	---	0.33	1.0	ug/l	J	0.32	1.0	ug/l	J	0.84	1.0	ug/l	J
Tetrachloroethene	127-18-4		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5		ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6		ND	1.0	ug/l	---	0.17	1.0	ug/l	J	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4		ND	1.0	ug/l	---	0.55	1.0	ug/l	J	ND	1.0	ug/l	---	3.1	1.0	ug/l	---	3.2	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim																										
1,4-Dioxane	123-91-1						ND	2.0	ug/l	---	1.5	2.0	ug/l	J	2.1	2.0	ug/l	---	2.0	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

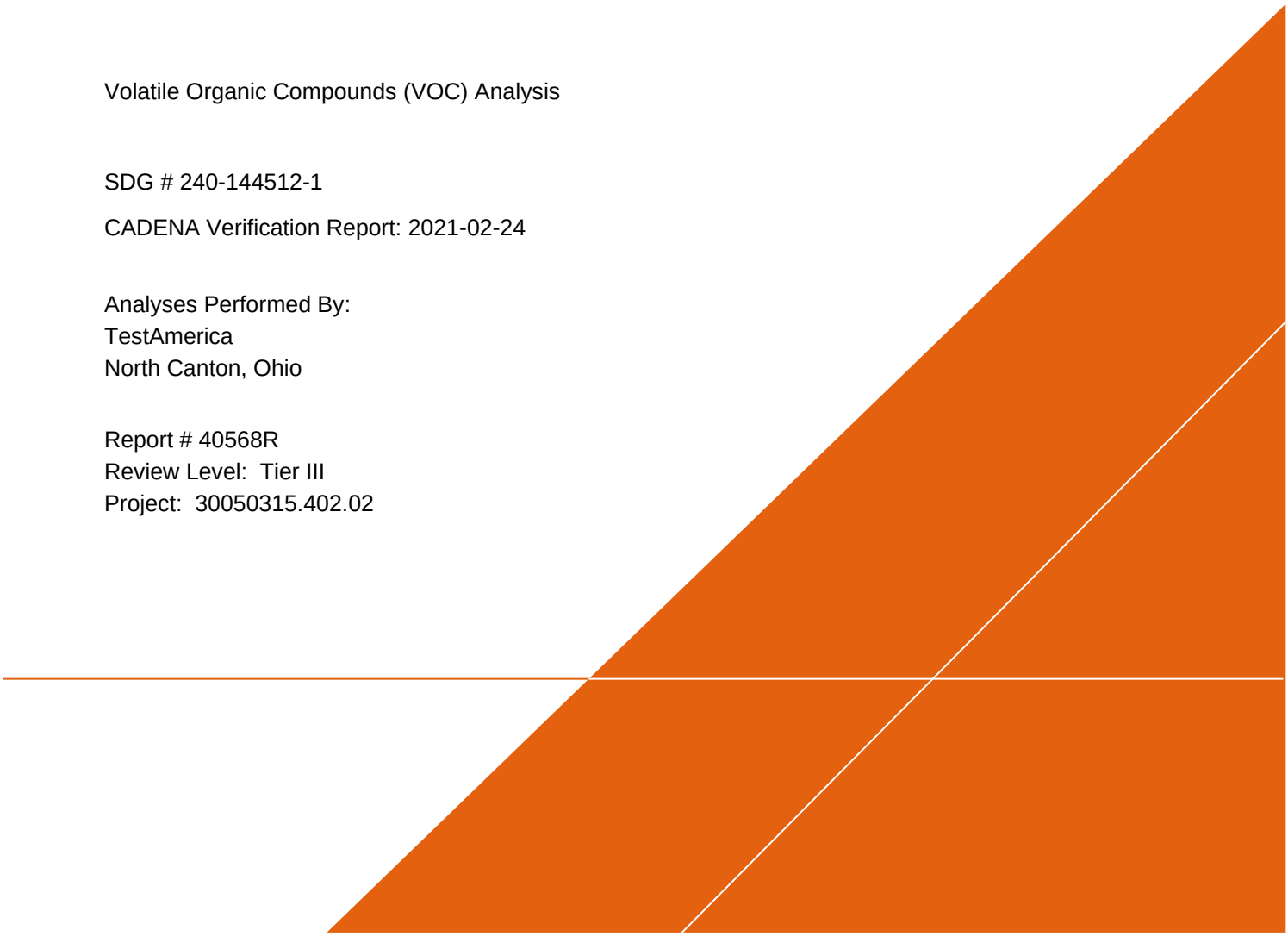
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144512-1

CADENA Verification Report: 2021-02-24

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40568R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144512-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144512-1	Water	02/11/2021		X	
MW-73SR_021121	240-144512-2	Water	02/11/2021		X	X
MW-73D_021121	240-144512-3	Water	02/11/2021		X	X
MW-74_021121	240-144512-4	Water	02/11/2021		X	X
DUP-09	240-144512-5	Water	02/11/2021	MW-74_021121	X	X
MW-74S_021121	240-144512-6	Water	02/11/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result (µg/L)	Duplicate Result (µg/L)	RPD
MW-74_021121 / DUP-09	1,4-Dioxane	2.1	2.0	AC
	Cis-1,2-Dichloroethene	0.33 J	0.32 J	AC
	Vinyl chloride	3.1	3.2	AC

Notes:

AC – Acceptable

The calculated differences between the parent sample and field duplicate were acceptable.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

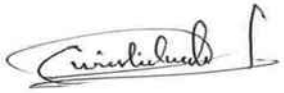
%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 17, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190 — TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name:	TAT if different from below: 10 day ✓ 3 weeks / 2 weeks / 1 week / 2 days / 1 day		Walk-in client
Project Name: Ford LTP Off-Site				Lab sampling
Project Number: 30050315.402.04	Method of Shipment/Carrier:			Job/SDG No:
PO # 30050315.402.04	Shipping/Tracking No:			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 trip blank
MW-735R_021121	2/11/21	10:17		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-73D_021121	2/11/21	11:57		6						6					N	G	X	X	X	X	X	X	X	
MW-74_021121	2/11/21	13:57		6						6					N	G	X	X	X	X	X	X	X	
DUP-09	2/11/21	—		6						6					N	G	X	X	X	X	X	X	X	
MW-74S_021121	2/11/21	15:32		6						6					N	G	X	X	X	X	X	X	X	

240-144512 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer ...): Return to Client / ✓ Disposal By Lab / Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com, Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	2/11/21 1600	Emma Witherspoon	Arcadis	2/11/21 16:00
Witherspoon	Arcadis	2/11/21 1700	~~[illegible]~~ NOVI cold storage	Arcadis	2/11/21 1700
Julia McClafferty	Arcadis	2/12/2021	Received in Laboratory by:	Company:	Date/Time:
Amanda Battchel ETA		2/12/21 11:01	Amanda Battchel	ETA	10:05 2/12/21
				ETA	2-13-21 800

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02/24/2021

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144512-1

Date Collected: 02/11/21 00:00
Date Received: 02/13/21 08:00

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 13:40	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 13:40	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 13:40	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 13:40	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 13:40	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/22/21 13:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*02/22/21 13:40*	*1*
4-Bromofluorobenzene (Surr)	*111*		*47 - 134*		*02/22/21 13:40*	*1*
Toluene-d8 (Surr)	*104*		*69 - 122*		*02/22/21 13:40*	*1*
Dibromofluoromethane (Surr)	*95*		*78 - 129*		*02/22/21 13:40*	*1*

Client Sample ID: MW-73SR_021121

Lab Sample ID: 240-144512-2

Date Collected: 02/11/21 10:17
Date Received: 02/13/21 08:00

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/19/21 14:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/19/21 14:56*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 14:03	1
cis-1,2-Dichloroethene	**1.5**		1.0	0.16	ug/L			02/22/21 14:03	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 14:03	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 14:03	1
Trichloroethene	**0.17**	**J**	1.0	0.10	ug/L			02/22/21 14:03	1
Vinyl chloride	**0.55**	**J**	1.0	0.20	ug/L			02/22/21 14:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*75 - 130*		*02/22/21 14:03*	*1*
4-Bromofluorobenzene (Surr)	*113*		*47 - 134*		*02/22/21 14:03*	*1*
Toluene-d8 (Surr)	*107*		*69 - 122*		*02/22/21 14:03*	*1*
Dibromofluoromethane (Surr)	*94*		*78 - 129*		*02/22/21 14:03*	*1*

Client Sample ID: MW-73D_021121

Lab Sample ID: 240-144512-3

Date Collected: 02/11/21 11:57
Date Received: 02/13/21 08:00

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**1.5**	**J**	2.0	0.86	ug/L			02/19/21 15:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/19/21 15:21*	*1*

Client Sample ID: MW-73D_021121

Lab Sample ID: 240-144512-3

Date Collected: 02/11/21 11:57
Matrix: Water
Date Received: 02/13/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 14:26	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 14:26	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 14:26	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 14:26	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 14:26	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/22/21 14:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*107*		*75 - 130*		*02/22/21 14:26*	*1*
4-Bromofluorobenzene (Surr)	*115*		*47 - 134*		*02/22/21 14:26*	*1*
Toluene-d8 (Surr)	*108*		*69 - 122*		*02/22/21 14:26*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*02/22/21 14:26*	*1*

Client Sample ID: MW-74_021121

Lab Sample ID: 240-144512-4

Date Collected: 02/11/21 13:57
Matrix: Water
Date Received: 02/13/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**2.1**		2.0	0.86	ug/L			02/19/21 15:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/19/21 15:47*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 14:48	1
cis-1,2-Dichloroethene	**0.33**	**J**	1.0	0.16	ug/L			02/22/21 14:48	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 14:48	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 14:48	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 14:48	1
Vinyl chloride	**3.1**		1.0	0.20	ug/L			02/22/21 14:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*75 - 130*		*02/22/21 14:48*	*1*
4-Bromofluorobenzene (Surr)	*117*		*47 - 134*		*02/22/21 14:48*	*1*
Toluene-d8 (Surr)	*108*		*69 - 122*		*02/22/21 14:48*	*1*
Dibromofluoromethane (Surr)	*97*		*78 - 129*		*02/22/21 14:48*	*1*

Client Sample ID: DUP-09

Lab Sample ID: 240-144512-5

Date Collected: 02/11/21 00:00
Matrix: Water
Date Received: 02/13/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**2.0**		2.0	0.86	ug/L			02/19/21 16:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/19/21 16:12*	*1*

Client Sample ID: DUP-09

Lab Sample ID: 240-144512-5

Date Collected: 02/11/21 00:00
Matrix: Water
Date Received: 02/13/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 15:11	1
cis-1,2-Dichloroethene	**0.32**	**J**	1.0	0.16	ug/L			02/22/21 15:11	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 15:11	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 15:11	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 15:11	1
Vinyl chloride	**3.2**		1.0	0.20	ug/L			02/22/21 15:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*75 - 130*		*02/22/21 15:11*	*1*
4-Bromofluorobenzene (Surr)	*113*		*47 - 134*		*02/22/21 15:11*	*1*
Toluene-d8 (Surr)	*108*		*69 - 122*		*02/22/21 15:11*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*02/22/21 15:11*	*1*

Client Sample ID: MW-74S_021121

Lab Sample ID: 240-144512-6

Date Collected: 02/11/21 15:32
Matrix: Water
Date Received: 02/13/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/19/21 16:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*		*02/19/21 16:38*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 15:33	1
cis-1,2-Dichloroethene	**0.84**	**J**	1.0	0.16	ug/L			02/22/21 15:33	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 15:33	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 15:33	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 15:33	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/22/21 15:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*75 - 130*		*02/22/21 15:33*	*1*
4-Bromofluorobenzene (Surr)	*115*		*47 - 134*		*02/22/21 15:33*	*1*
Toluene-d8 (Surr)	*108*		*69 - 122*		*02/22/21 15:33*	*1*
Dibromofluoromethane (Surr)	*101*		*78 - 129*		*02/22/21 15:33*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144576-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
2/28/2021 2:06:51 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144576-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144576-1

Job ID: 240-144576-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144576-1

Comments
No additional comments.

Receipt
The samples were received on 2/17/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.1º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144576-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144576-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144576-1	TRIP BLANK	Water	02/12/21 00:00	02/17/21 08:00	
240-144576-2	MW-100S_021221	Water	02/12/21 10:10	02/17/21 08:00	
240-144576-3	MW-101S_021221	Water	02/12/21 11:57	02/17/21 08:00	
240-144576-4	MW-76_021221	Water	02/12/21 13:20	02/17/21 08:00	
240-144576-5	MW-76S_021221	Water	02/12/21 15:12	02/17/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144576-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144576-1

No Detections.

Client Sample ID: MW-100S_021221 — Lab Sample ID: 240-144576-2

No Detections.

Client Sample ID: MW-101S_021221 — Lab Sample ID: 240-144576-3

No Detections.

Client Sample ID: MW-76_021221 — Lab Sample ID: 240-144576-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	0.52	J	1.0	0.16	ug/L	1		8260B	Total/NA

Client Sample ID: MW-76S_021221 — Lab Sample ID: 240-144576-5

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144576-1

Client Sample ID: TRIP BLANK
Date Collected: 02/12/21 00:00
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144576-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 17:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/23/21 17:50	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 17:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 17:50	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/23/21 17:50	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/23/21 17:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*75 - 130*		*02/23/21 17:50*	*1*
4-Bromofluorobenzene (Surr)	*85*		*47 - 134*		*02/23/21 17:50*	*1*
Toluene-d8 (Surr)	*99*		*69 - 122*		*02/23/21 17:50*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*02/23/21 17:50*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144576-1

Client Sample ID: MW-100S_021221
Date Collected: 02/12/21 10:10
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144576-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 20:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/22/21 20:24*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 18:13	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/23/21 18:13	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 18:13	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 18:13	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/23/21 18:13	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/23/21 18:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*75 - 130*		*02/23/21 18:13*	*1*
4-Bromofluorobenzene (Surr)	*92*		*47 - 134*		*02/23/21 18:13*	*1*
Toluene-d8 (Surr)	*103*		*69 - 122*		*02/23/21 18:13*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*02/23/21 18:13*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144576-1

Client Sample ID: MW-101S_021221
Date Collected: 02/12/21 11:57
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144576-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 21:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/22/21 21:40*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 19:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/23/21 19:19	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 19:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 19:19	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/23/21 19:19	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/23/21 19:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*75 - 130*		*02/23/21 19:19*	*1*
4-Bromofluorobenzene (Surr)	*90*		*47 - 134*		*02/23/21 19:19*	*1*
Toluene-d8 (Surr)	*102*		*69 - 122*		*02/23/21 19:19*	*1*
Dibromofluoromethane (Surr)	*100*		*78 - 129*		*02/23/21 19:19*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144576-1

Client Sample ID: MW-76_021221
Date Collected: 02/12/21 13:20
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144576-4
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 22:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*		*02/22/21 22:05*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 11:35	1
cis-1,2-Dichloroethene	**0.52**	**J**	1.0	0.16	ug/L			02/24/21 11:35	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 11:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 11:35	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 11:35	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 11:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*02/24/21 11:35*	*1*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*		*02/24/21 11:35*	*1*
Toluene-d8 (Surr)	*98*		*69 - 122*		*02/24/21 11:35*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*02/24/21 11:35*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144576-1

Client Sample ID: MW-76S_021221
Date Collected: 02/12/21 15:12
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144576-5
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 22:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/22/21 22:30*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 11:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 11:57	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 11:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 11:57	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 11:57	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 11:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*75 - 130*		*02/24/21 11:57*	*1*
4-Bromofluorobenzene (Surr)	*94*		*47 - 134*		*02/24/21 11:57*	*1*
Toluene-d8 (Surr)	*107*		*69 - 122*		*02/24/21 11:57*	*1*
Dibromofluoromethane (Surr)	*102*		*78 - 129*		*02/24/21 11:57*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144576-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144576-1	TRIP BLANK	96	85	99	98
240-144576-2	MW-100S_021221	103	92	103	103
240-144576-2 MS	MW-100S-MS_021221	97	96	103	97
240-144576-2 MSD	MW-100S-MSD_021221	95	93	98	97
240-144576-3	MW-101S_021221	102	90	102	100
240-144576-4	MW-76_021221	101	91	98	98
240-144576-5	MW-76S_021221	105	94	107	102
240-144585-E-7 MS	Matrix Spike	96	91	97	100
240-144585-E-7 MSD	Matrix Spike Duplicate	101	98	105	103
LCS 240-474092/4	Lab Control Sample	101	103	105	109
LCS 240-474261/4	Lab Control Sample	93	91	98	95
MB 240-474092/6	Method Blank	98	87	101	98
MB 240-474261/6	Method Blank	102	93	105	100

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144576-2	MW-100S_021221	80
240-144576-2 MS	MW-100S-MS_021221	81
240-144576-2 MSD	MW-100S-MSD_021221	81
240-144576-3	MW-101S_021221	83
240-144576-4	MW-76_021221	86
240-144576-5	MW-76S_021221	83
LCS 240-473970/4	Lab Control Sample	80
MB 240-473970/5	Method Blank	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474092/6
Matrix: Water
Analysis Batch: 474092

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 11:10	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/23/21 11:10	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 11:10	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 11:10	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/23/21 11:10	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/23/21 11:10	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 130*		*02/23/21 11:10*	*1*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*		*02/23/21 11:10*	*1*
Toluene-d8 (Surr)	*101*		*69 - 122*		*02/23/21 11:10*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*02/23/21 11:10*	*1*

Lab Sample ID: LCS 240-474092/4
Matrix: Water
Analysis Batch: 474092

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.9		ug/L		109	73 - 129
cis-1,2-Dichloroethene	10.0	10.8		ug/L		108	75 - 124
Tetrachloroethene	10.0	11.7		ug/L		117	70 - 125
trans-1,2-Dichloroethene	10.0	10.6		ug/L		106	74 - 130
Trichloroethene	10.0	10.4		ug/L		104	71 - 121
Vinyl chloride	10.0	11.4		ug/L		114	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*
Toluene-d8 (Surr)	*105*		*69 - 122*
Dibromofluoromethane (Surr)	*109*		*78 - 129*

Lab Sample ID: 240-144576-2 MS
Matrix: Water
Analysis Batch: 474092

Client Sample ID: MW-100S-MS_021221
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.00		ug/L		90	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	9.45		ug/L		95	68 - 121
Tetrachloroethene	1.0	U	10.0	8.55		ug/L		85	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.17		ug/L		92	69 - 126
Trichloroethene	1.0	U	10.0	9.03		ug/L		90	56 - 124
Vinyl chloride	1.0	U	10.0	9.58		ug/L		96	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*
Toluene-d8 (Surr)	*103*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144576-2 MS
Matrix: Water
Analysis Batch: 474092

Client Sample ID: MW-100S-MS_021221
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	97		78 - 129

Lab Sample ID: 240-144576-2 MSD
Matrix: Water
Analysis Batch: 474092

Client Sample ID: MW-100S-MSD_021221
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.58		ug/L		96	64 - 132	6	35
cis-1,2-Dichloroethene	1.0	U	10.0	9.91		ug/L		99	68 - 121	5	35
Tetrachloroethene	1.0	U	10.0	10.1		ug/L		101	52 - 129	17	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.82		ug/L		98	69 - 126	7	35
Trichloroethene	1.0	U	10.0	10.2		ug/L		102	56 - 124	12	35
Vinyl chloride	1.0	U	10.0	10.5		ug/L		105	49 - 136	9	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	95		75 - 130
4-Bromofluorobenzene (Surr)	93		47 - 134
Toluene-d8 (Surr)	98		69 - 122
Dibromofluoromethane (Surr)	97		78 - 129

Lab Sample ID: MB 240-474261/6
Matrix: Water
Analysis Batch: 474261

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 11:12	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 11:12	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 11:12	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 11:12	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 11:12	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 11:12	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	102		75 - 130		02/24/21 11:12	1
4-Bromofluorobenzene (Surr)	93		47 - 134		02/24/21 11:12	1
Toluene-d8 (Surr)	105		69 - 122		02/24/21 11:12	1
Dibromofluoromethane (Surr)	100		78 - 129		02/24/21 11:12	1

Lab Sample ID: LCS 240-474261/4
Matrix: Water
Analysis Batch: 474261

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.2		ug/L		102	73 - 129
cis-1,2-Dichloroethene	10.0	9.76		ug/L		98	75 - 124
Tetrachloroethene	10.0	10.4		ug/L		104	70 - 125
trans-1,2-Dichloroethene	10.0	9.65		ug/L		97	74 - 130
Trichloroethene	10.0	10.1		ug/L		101	71 - 121

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-474261/4
Matrix: Water
Analysis Batch: 474261

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Vinyl chloride			10.0	9.62		ug/L		96	61 - 134		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*
Toluene-d8 (Surr)	*98*		*69 - 122*
Dibromofluoromethane (Surr)	*95*		*78 - 129*

Lab Sample ID: 240-144585-E-7 MS
Matrix: Water
Analysis Batch: 474261

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,1-Dichloroethene	17	U	167	148		ug/L		89	64 - 132		
cis-1,2-Dichloroethene	260		167	407		ug/L		90	68 - 121		
Tetrachloroethene	17	U	167	148		ug/L		89	52 - 129		
trans-1,2-Dichloroethene	17	U	167	161		ug/L		96	69 - 126		
Trichloroethene	17	U	167	149		ug/L		89	56 - 124		
Vinyl chloride	460		167	594		ug/L		78	49 - 136		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*96*		*75 - 130*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*
Toluene-d8 (Surr)	*97*		*69 - 122*
Dibromofluoromethane (Surr)	*100*		*78 - 129*

Lab Sample ID: 240-144585-E-7 MSD
Matrix: Water
Analysis Batch: 474261

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	17	U	167	167		ug/L		100	64 - 132	12	35
cis-1,2-Dichloroethene	260		167	426		ug/L		101	68 - 121	5	35
Tetrachloroethene	17	U	167	165		ug/L		99	52 - 129	11	35
trans-1,2-Dichloroethene	17	U	167	168		ug/L		101	69 - 126	4	35
Trichloroethene	17	U	167	166		ug/L		99	56 - 124	11	35
Vinyl chloride	460		167	625		ug/L		96	49 - 136	5	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*
4-Bromofluorobenzene (Surr)	*98*		*47 - 134*
Toluene-d8 (Surr)	*105*		*69 - 122*
Dibromofluoromethane (Surr)	*103*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473970/5
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 14:03	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/22/21 14:03*	*1*

Lab Sample ID: LCS 240-473970/4
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.3		ug/L		103	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*

Lab Sample ID: 240-144576-2 MS
Matrix: Water
Analysis Batch: 473970

Client Sample ID: MW-100S-MS_021221
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	10.7		ug/L		107	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

Lab Sample ID: 240-144576-2 MSD
Matrix: Water
Analysis Batch: 473970

Client Sample ID: MW-100S-MSD_021221
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	11.1		ug/L		111	46 - 170	4	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144576-1

GC/MS VOA

Analysis Batch: 473970

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144576-2	MW-100S_021221	Total/NA	Water	8260B SIM	
240-144576-3	MW-101S_021221	Total/NA	Water	8260B SIM	
240-144576-4	MW-76_021221	Total/NA	Water	8260B SIM	
240-144576-5	MW-76S_021221	Total/NA	Water	8260B SIM	
MB 240-473970/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-473970/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144576-2 MS	MW-100S-MS_021221	Total/NA	Water	8260B SIM	
240-144576-2 MSD	MW-100S-MSD_021221	Total/NA	Water	8260B SIM	

Analysis Batch: 474092

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144576-1	TRIP BLANK	Total/NA	Water	8260B	
240-144576-2	MW-100S_021221	Total/NA	Water	8260B	
240-144576-3	MW-101S_021221	Total/NA	Water	8260B	
MB 240-474092/6	Method Blank	Total/NA	Water	8260B	
LCS 240-474092/4	Lab Control Sample	Total/NA	Water	8260B	
240-144576-2 MS	MW-100S-MS_021221	Total/NA	Water	8260B	
240-144576-2 MSD	MW-100S-MSD_021221	Total/NA	Water	8260B	

Analysis Batch: 474261

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144576-4	MW-76_021221	Total/NA	Water	8260B	
240-144576-5	MW-76S_021221	Total/NA	Water	8260B	
MB 240-474261/6	Method Blank	Total/NA	Water	8260B	
LCS 240-474261/4	Lab Control Sample	Total/NA	Water	8260B	
240-144585-E-7 MS	Matrix Spike	Total/NA	Water	8260B	
240-144585-E-7 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144576-1

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144576-1
Date Collected: 02/12/21 00:00
Matrix: Water
Date Received: 02/17/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474092	02/23/21 17:50	LEE	TAL CAN

Client Sample ID: MW-100S_021221
Lab Sample ID: 240-144576-2
Date Collected: 02/12/21 10:10
Matrix: Water
Date Received: 02/17/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474092	02/23/21 18:13	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	473970	02/22/21 20:24	SAM	TAL CAN

Client Sample ID: MW-101S_021221
Lab Sample ID: 240-144576-3
Date Collected: 02/12/21 11:57
Matrix: Water
Date Received: 02/17/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474092	02/23/21 19:19	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	473970	02/22/21 21:40	SAM	TAL CAN

Client Sample ID: MW-76_021221
Lab Sample ID: 240-144576-4
Date Collected: 02/12/21 13:20
Matrix: Water
Date Received: 02/17/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474261	02/24/21 11:35	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	473970	02/22/21 22:05	SAM	TAL CAN

Client Sample ID: MW-76S_021221
Lab Sample ID: 240-144576-5
Date Collected: 02/12/21 15:12
Matrix: Water
Date Received: 02/17/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474261	02/24/21 11:57	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	473970	02/22/21 22:30	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144576-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

MICHIGAN TestAmerica 190

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Allyson Hartz		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

COC No:

/ of / COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below

10 day: 3 weeks / 2 weeks / 1 week / 2 days / 1 day

Analyses

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM					Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X					1 trip blank
MW-100S_021221	2/12/21	10:10		6						6					N	G	X	X	X	X	X	X	X					3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-100S-MS_021221	2/12/21	10:10		6						6					N	G	X	X	X	X	X	X	X					run MS/MSD
MW-100S-MSD_021221	2/12/21	10:10		6						6					N	G	X	X	X	X	X	X	X					run MS/MSD
MW-101S_021221	2/12/21	11:57		6						6					N	G	X	X	X	X	X	X	X					
MW-76_021221	2/12/21	13:20		6						6					N	G	X	X	X	X	X	X	X					
MW-76S_021221	2/12/21	15:12		6						6					N	G	X	X	X	X	X	X	X					

Possible Hazard Identification: Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed i: Return to Client / Disposal B

240-144576 Chain of Custody

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
A Hartz	Arcadis	2/12/21 16:30	Novi cold storage	Arcadis	2/12/21 16:30
Christin Ulmer	ARCADIS	2/15/21 / 1010	Amanda Battishill	ETA	2/15/21 / 1010
Amanda Battishill	ETA	2/15/21 10:57	Received in Laboratory by:	Company:	Date/Time:

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Amanda Battishill ETA 2/16/21 907

AB ~~Amanda Battishill~~ E
COLD STORAGE ETA 2/15/21 10:57

~~Matt~~ ETA 2-17-21 800

2/28/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 144574**
Canton Facility

Client Arcadis Site Name

Cooler unpacked by: MathSnyder

Cooler Received on 2-17-21 Opened on 2-17-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: ~~Bubble Wrap~~ Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 4.6 °C Corrected Cooler Temp. 4.7 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity ____ (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? (Yes) No
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ____ (Yes) No
17. Was a LL Hg or Me Hg trip blank present? ____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT



February 28, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144576-1
Sample date: 2021-02-12
Report received by CADENA: 2021-02-28
Initial Data Verification completed by CADENA: 2021-02-28
Number of Samples:5
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, MS/MSD Recovery, MS/MSD RPD, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144576-1

	Sample Name:	TRIP BLANK				MW-100S_021221				MW-101S_021221				MW-76_021221				MW-76S_021221			
	Lab Sample ID:	2401445761				2401445762				2401445763				2401445764				2401445765			
	Sample Date:	2/12/2021				2/12/2021				2/12/2021				2/12/2021				2/12/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC																					
OSW-8260B																					
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	0.52	1.0	ug/l	J	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim																					
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---	ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

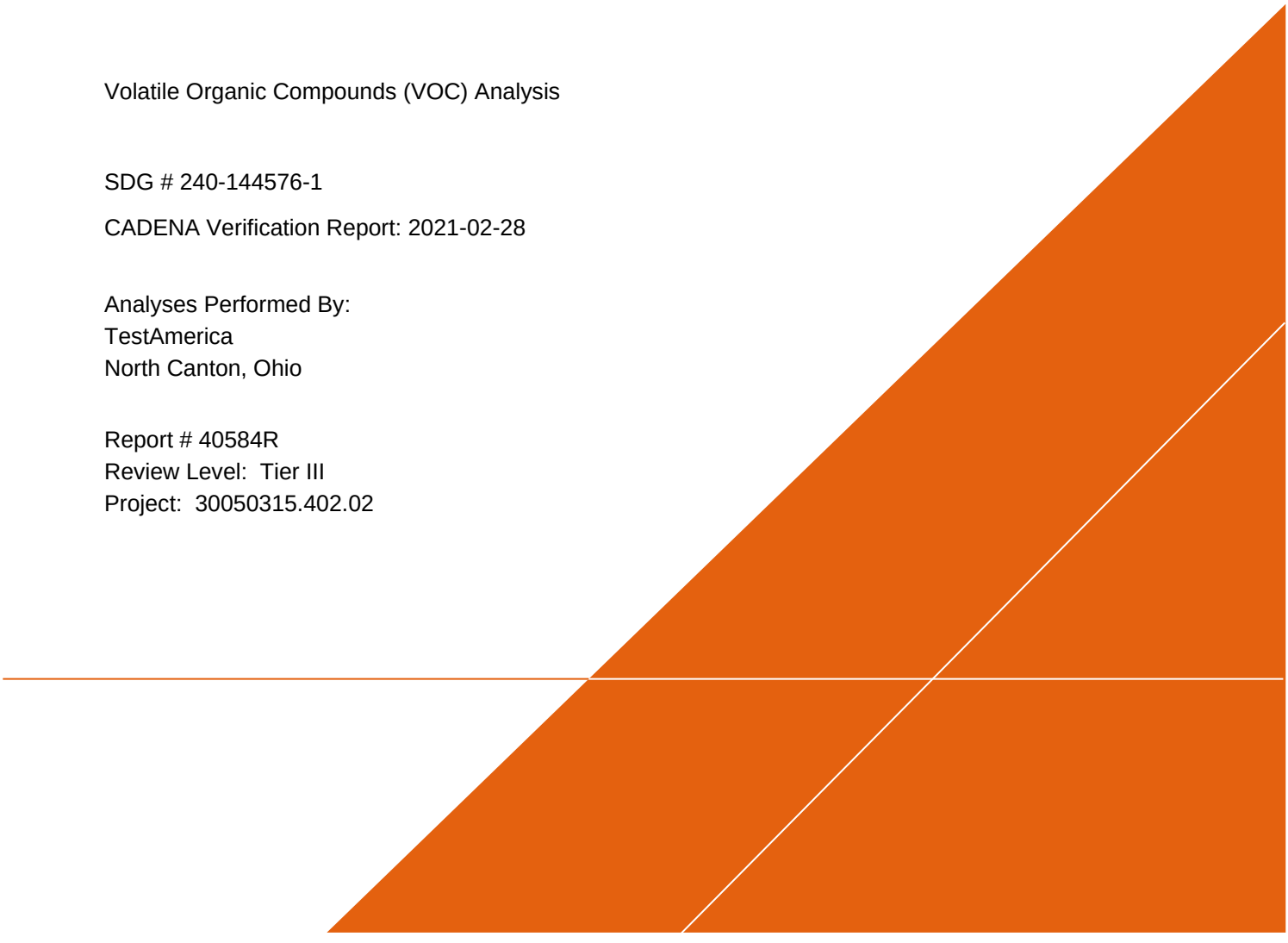
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144576-1

CADENA Verification Report: 2021-02-28

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40584R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144576-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144576-1	Water	02/12/2021		X	
MW-100S_021221	240-144576-2	Water	02/12/2021		X	X
MW-101S_021221	240-144576-3	Water	02/12/2021		X	X
MW-76_021221	240-144576-4	Water	02/12/2021		X	X
MW-76S_021221	240-144576-5	Water	02/12/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

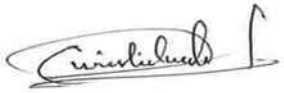
%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 17, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 18, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190 TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

Client Contact

Company Name: Arcadis
Address: 28550 Cabot Drive, Suite 500
City/State/Zip: Novi, MI, 48377
Phone: 248-994-2240
Project Name: Ford LTP Off-Site
Project Number: 30050315.402.04
PO # 30050315.402.04

Client Project Manager: Kris Hinskey
Telephone: 248-994-2240
Email: kristoffer.hinskey@arcadis.com
Sampler Name: Allyson Hartz
Method of Shipment/Carrier:
Shipping/Tracking No:

Site Contact: Julia McClafferty
Telephone: 734-644-5131

Lab Contact: Mike DelMonico
Telephone: 330-497-9396

TestAmerica Laboratories, Inc.
COC No:
1 of 1 COCs
For lab use only
Walk-in client
Lab sampling
Job/SDG No:

Analysis Turnaround Time
TAT if different from below
10 day
3 weeks
2 weeks
1 week
2 days
1 day

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM					Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X					1 trip blank
MW-100S_021221	2/12/21	10:10		6						6					N	G	X	X	X	X	X	X	X					3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-100S-MS_021221	2/12/21	10:10		6						6					N	G	X	X	X	X	X	X	X					run MS/MSD
MW-100S-MSD_021221	2/12/21	10:10		6						6					N	G	X	X	X	X	X	X	X					run MS/MSD
MW-101S_021221	2/12/21	11:57		6						6					N	G	X	X	X	X	X	X	X					
MW-76_021221	2/12/21	13:20		6						6					N	G	X	X	X	X	X	X	X					
MW-76S_021221	2/12/21	15:12		6						6					N	G	X	X	X	X	X	X	X					



Possible Hazard Identification
Non-Hazard Flammable Skin Irritant Poison B Unknown

Sample Disposal (A fee may be assessed i
Return to Client Disposal B

240-144576 Chain of Custody

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
A Hartz	Arcadis	2/12/21 16:30	Navi cold storage	Arcadis	2/12/21 16:30
Christin Ulmer	ARCADIS	2/15/21 / 1010	Amanda Battishell	ETA	2/15/21 / 1010
Amanda Battishell	ETA	2/15/21 10:57	Received in Laboratory by:	Company:	Date/Time:

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Amanda Battishell ETA 2/16/21 907

AB Amanda Battishell E
COLD STORAGE ETA 2/15/21 10:57
[signature] ETA 2-17-21 800

02/28/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144576-1
Date Collected: 02/12/21 00:00
Matrix: Water
Date Received: 02/17/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 17:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/23/21 17:50	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 17:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 17:50	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/23/21 17:50	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/23/21 17:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*75 - 130*		*02/23/21 17:50*	*1*
4-Bromofluorobenzene (Surr)	*85*		*47 - 134*		*02/23/21 17:50*	*1*
Toluene-d8 (Surr)	*99*		*69 - 122*		*02/23/21 17:50*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*02/23/21 17:50*	*1*

Client Sample ID: MW-100S_021221
Lab Sample ID: 240-144576-2
Date Collected: 02/12/21 10:10
Matrix: Water
Date Received: 02/17/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 20:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/22/21 20:24*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 18:13	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/23/21 18:13	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 18:13	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 18:13	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/23/21 18:13	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/23/21 18:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*75 - 130*		*02/23/21 18:13*	*1*
4-Bromofluorobenzene (Surr)	*92*		*47 - 134*		*02/23/21 18:13*	*1*
Toluene-d8 (Surr)	*103*		*69 - 122*		*02/23/21 18:13*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*02/23/21 18:13*	*1*

Client Sample ID: MW-101S_021221
Lab Sample ID: 240-144576-3
Date Collected: 02/12/21 11:57
Matrix: Water
Date Received: 02/17/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 21:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/22/21 21:40*	*1*

Client Sample ID: MW-101S_021221

Lab Sample ID: 240-144576-3

Date Collected: 02/12/21 11:57
Matrix: Water
Date Received: 02/17/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 19:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/23/21 19:19	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/23/21 19:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/23/21 19:19	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/23/21 19:19	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/23/21 19:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*75 - 130*		*02/23/21 19:19*	*1*
4-Bromofluorobenzene (Surr)	*90*		*47 - 134*		*02/23/21 19:19*	*1*
Toluene-d8 (Surr)	*102*		*69 - 122*		*02/23/21 19:19*	*1*
Dibromofluoromethane (Surr)	*100*		*78 - 129*		*02/23/21 19:19*	*1*

Client Sample ID: MW-76_021221

Lab Sample ID: 240-144576-4

Date Collected: 02/12/21 13:20
Matrix: Water
Date Received: 02/17/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 22:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*		*02/22/21 22:05*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 11:35	1
cis-1,2-Dichloroethene	**0.52**	**J**	1.0	0.16	ug/L			02/24/21 11:35	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 11:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 11:35	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 11:35	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 11:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*02/24/21 11:35*	*1*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*		*02/24/21 11:35*	*1*
Toluene-d8 (Surr)	*98*		*69 - 122*		*02/24/21 11:35*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*02/24/21 11:35*	*1*

Client Sample ID: MW-76S_021221

Lab Sample ID: 240-144576-5

Date Collected: 02/12/21 15:12
Matrix: Water
Date Received: 02/17/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 22:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/22/21 22:30*	*1*

Client Sample ID: MW-76S_021221
Lab Sample ID: 240-144576-5

Date Collected: 02/12/21 15:12
Matrix: Water
Date Received: 02/17/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 11:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 11:57	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 11:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 11:57	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 11:57	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 11:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*75 - 130*		*02/24/21 11:57*	*1*
4-Bromofluorobenzene (Surr)	*94*		*47 - 134*		*02/24/21 11:57*	*1*
Toluene-d8 (Surr)	*107*		*69 - 122*		*02/24/21 11:57*	*1*
Dibromofluoromethane (Surr)	*102*		*78 - 129*		*02/24/21 11:57*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144515-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
2/24/2021 11:48:52 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144515-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144515-1

Job ID: 240-144515-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144515-1

Comments
No additional comments.

Receipt
The samples were received on 2/13/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.6º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144515-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144515-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144515-1	TRIP BLANK	Water	02/11/21 00:00	02/13/21 08:00	
240-144515-2	MW-97S_021121	Water	02/11/21 10:26	02/13/21 08:00	
240-144515-3	MW-77S_021121	Water	02/11/21 12:12	02/13/21 08:00	
240-144515-4	MW-77_021121	Water	02/11/21 13:55	02/13/21 08:00	
240-144515-5	MW-96S_021121	Water	02/11/21 15:22	02/13/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144515-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144515-1

No Detections.

Client Sample ID: MW-97S_021121 — Lab Sample ID: 240-144515-2

No Detections.

Client Sample ID: MW-77S_021121 — Lab Sample ID: 240-144515-3

No Detections.

Client Sample ID: MW-77_021121 — Lab Sample ID: 240-144515-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	0.56	J	1.0	0.16	ug/L	1		8260B	Total/NA

Client Sample ID: MW-96S_021121 — Lab Sample ID: 240-144515-5

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144515-1

Client Sample ID: TRIP BLANK
Date Collected: 02/11/21 00:00
Date Received: 02/13/21 08:00

Lab Sample ID: 240-144515-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 15:56	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 15:56	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 15:56	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 15:56	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 15:56	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/22/21 15:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*75 - 130*		*02/22/21 15:56*	*1*
4-Bromofluorobenzene (Surr)	*111*		*47 - 134*		*02/22/21 15:56*	*1*
Toluene-d8 (Surr)	*105*		*69 - 122*		*02/22/21 15:56*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*02/22/21 15:56*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144515-1

Client Sample ID: MW-97S_021121
Date Collected: 02/11/21 10:26
Date Received: 02/13/21 08:00

Lab Sample ID: 240-144515-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/19/21 17:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*		*02/19/21 17:03*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 16:18	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 16:18	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 16:18	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 16:18	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 16:18	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/22/21 16:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*75 - 130*		*02/22/21 16:18*	*1*
4-Bromofluorobenzene (Surr)	*116*		*47 - 134*		*02/22/21 16:18*	*1*
Toluene-d8 (Surr)	*108*		*69 - 122*		*02/22/21 16:18*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*02/22/21 16:18*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144515-1

Client Sample ID: MW-77S_021121
Date Collected: 02/11/21 12:12
Date Received: 02/13/21 08:00

Lab Sample ID: 240-144515-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/19/21 17:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*		*02/19/21 17:28*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 16:40	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 16:40	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 16:40	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 16:40	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 16:40	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/22/21 16:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*75 - 130*		*02/22/21 16:40*	*1*
4-Bromofluorobenzene (Surr)	*115*		*47 - 134*		*02/22/21 16:40*	*1*
Toluene-d8 (Surr)	*107*		*69 - 122*		*02/22/21 16:40*	*1*
Dibromofluoromethane (Surr)	*100*		*78 - 129*		*02/22/21 16:40*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144515-1

Client Sample ID: MW-77_021121
Date Collected: 02/11/21 13:55
Date Received: 02/13/21 08:00

Lab Sample ID: 240-144515-4
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/19/21 18:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/19/21 18:44*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 17:03	1
cis-1,2-Dichloroethene	**0.56**	**J**	1.0	0.16	ug/L			02/22/21 17:03	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 17:03	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 17:03	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 17:03	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/22/21 17:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*75 - 130*		*02/22/21 17:03*	*1*
4-Bromofluorobenzene (Surr)	*115*		*47 - 134*		*02/22/21 17:03*	*1*
Toluene-d8 (Surr)	*108*		*69 - 122*		*02/22/21 17:03*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*02/22/21 17:03*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144515-1

Client Sample ID: MW-96S_021121
Date Collected: 02/11/21 15:22
Date Received: 02/13/21 08:00

Lab Sample ID: 240-144515-5
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/19/21 19:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/19/21 19:10*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 17:25	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 17:25	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 17:25	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 17:25	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 17:25	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/22/21 17:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*75 - 130*		*02/22/21 17:25*	*1*
4-Bromofluorobenzene (Surr)	*110*		*47 - 134*		*02/22/21 17:25*	*1*
Toluene-d8 (Surr)	*104*		*69 - 122*		*02/22/21 17:25*	*1*
Dibromofluoromethane (Surr)	*95*		*78 - 129*		*02/22/21 17:25*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144515-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144515-1	TRIP BLANK	102	111	105	98
240-144515-2	MW-97S_021121	105	116	108	99
240-144515-3	MW-77S_021121	108	115	107	100
240-144515-3 MS	MW-77S-MS_021121	108	118	110	101
240-144515-3 MSD	MW-77S-MSD_021121	104	115	106	98
240-144515-4	MW-77_021121	106	115	108	99
240-144515-5	MW-96S_021121	102	110	104	95
LCS 240-473923/5	Lab Control Sample	105	118	109	99
MB 240-473923/8	Method Blank	103	112	106	95

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144515-2	MW-97S_021121	79
240-144515-3	MW-77S_021121	79
240-144515-3 MS	MW-77S-MS_021121	82
240-144515-3 MSD	MW-77S-MSD_021121	80
240-144515-4	MW-77_021121	83
240-144515-5	MW-96S_021121	83
LCS 240-473720/4	Lab Control Sample	82
MB 240-473720/5	Method Blank	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473923/8
Matrix: Water
Analysis Batch: 473923

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 11:12	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 11:12	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 11:12	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 11:12	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 11:12	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/22/21 11:12	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*75 - 130*		*02/22/21 11:12*	*1*
4-Bromofluorobenzene (Surr)	*112*		*47 - 134*		*02/22/21 11:12*	*1*
Toluene-d8 (Surr)	*106*		*69 - 122*		*02/22/21 11:12*	*1*
Dibromofluoromethane (Surr)	*95*		*78 - 129*		*02/22/21 11:12*	*1*

Lab Sample ID: LCS 240-473923/5
Matrix: Water
Analysis Batch: 473923

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	20.0	18.8		ug/L		94	73 - 129
cis-1,2-Dichloroethene	20.0	17.6		ug/L		88	75 - 124
Tetrachloroethene	20.0	19.8		ug/L		99	70 - 125
trans-1,2-Dichloroethene	20.0	18.6		ug/L		93	74 - 130
Trichloroethene	20.0	18.8		ug/L		94	71 - 121
Vinyl chloride	20.0	19.9		ug/L		99	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*105*		*75 - 130*
4-Bromofluorobenzene (Surr)	*118*		*47 - 134*
Toluene-d8 (Surr)	*109*		*69 - 122*
Dibromofluoromethane (Surr)	*99*		*78 - 129*

Lab Sample ID: 240-144515-3 MS
Matrix: Water
Analysis Batch: 473923

Client Sample ID: MW-77S-MS_021121
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	20.0	19.1		ug/L		96	64 - 132
cis-1,2-Dichloroethene	1.0	U	20.0	18.1		ug/L		91	68 - 121
Tetrachloroethene	1.0	U	20.0	20.0		ug/L		100	52 - 129
trans-1,2-Dichloroethene	1.0	U	20.0	18.6		ug/L		93	69 - 126
Trichloroethene	1.0	U	20.0	18.8		ug/L		94	56 - 124
Vinyl chloride	1.0	U	20.0	17.9		ug/L		90	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*108*		*75 - 130*
4-Bromofluorobenzene (Surr)	*118*		*47 - 134*
Toluene-d8 (Surr)	*110*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144515-3 MS
Matrix: Water
Analysis Batch: 473923

Client Sample ID: MW-77S-MS_021121
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*101*		*78 - 129*

Lab Sample ID: 240-144515-3 MSD
Matrix: Water
Analysis Batch: 473923

Client Sample ID: MW-77S-MSD_021121
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	20.0	19.4		ug/L		97	64 - 132	1	35
cis-1,2-Dichloroethene	1.0	U	20.0	17.9		ug/L		89	68 - 121	1	35
Tetrachloroethene	1.0	U	20.0	19.6		ug/L		98	52 - 129	2	35
trans-1,2-Dichloroethene	1.0	U	20.0	18.5		ug/L		92	69 - 126	1	35
Trichloroethene	1.0	U	20.0	18.3		ug/L		92	56 - 124	2	35
Vinyl chloride	1.0	U	20.0	18.3		ug/L		92	49 - 136	2	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*
4-Bromofluorobenzene (Surr)	*115*		*47 - 134*
Toluene-d8 (Surr)	*106*		*69 - 122*
Dibromofluoromethane (Surr)	*98*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473720/5
Matrix: Water
Analysis Batch: 473720

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/19/21 11:08	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/19/21 11:08*	*1*

Lab Sample ID: LCS 240-473720/4
Matrix: Water
Analysis Batch: 473720

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.95		ug/L		100	80 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144515-3 MS
Matrix: Water
Analysis Batch: 473720

Client Sample ID: MW-77S-MS_021121
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	11.0		ug/L		110	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144515-3 MSD
Matrix: Water
Analysis Batch: 473720

Client Sample ID: MW-77S-MSD_021121
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.6		ug/L		106	46 - 170	3	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144515-1

GC/MS VOA

Analysis Batch: 473720

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144515-2	MW-97S_021121	Total/NA	Water	8260B SIM	
240-144515-3	MW-77S_021121	Total/NA	Water	8260B SIM	
240-144515-4	MW-77_021121	Total/NA	Water	8260B SIM	
240-144515-5	MW-96S_021121	Total/NA	Water	8260B SIM	
MB 240-473720/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-473720/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144515-3 MS	MW-77S-MS_021121	Total/NA	Water	8260B SIM	
240-144515-3 MSD	MW-77S-MSD_021121	Total/NA	Water	8260B SIM	

Analysis Batch: 473923

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144515-1	TRIP BLANK	Total/NA	Water	8260B	
240-144515-2	MW-97S_021121	Total/NA	Water	8260B	
240-144515-3	MW-77S_021121	Total/NA	Water	8260B	
240-144515-4	MW-77_021121	Total/NA	Water	8260B	
240-144515-5	MW-96S_021121	Total/NA	Water	8260B	
MB 240-473923/8	Method Blank	Total/NA	Water	8260B	
LCS 240-473923/5	Lab Control Sample	Total/NA	Water	8260B	
240-144515-3 MS	MW-77S-MS_021121	Total/NA	Water	8260B	
240-144515-3 MSD	MW-77S-MSD_021121	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144515-1

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144515-1
Date Collected: 02/11/21 00:00
Matrix: Water
Date Received: 02/13/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473923	02/22/21 15:56	HMB	TAL CAN

Client Sample ID: MW-97S_021121
Lab Sample ID: 240-144515-2
Date Collected: 02/11/21 10:26
Matrix: Water
Date Received: 02/13/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473923	02/22/21 16:18	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		1	473720	02/19/21 17:03	SAM	TAL CAN

Client Sample ID: MW-77S_021121
Lab Sample ID: 240-144515-3
Date Collected: 02/11/21 12:12
Matrix: Water
Date Received: 02/13/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473923	02/22/21 16:40	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		1	473720	02/19/21 17:28	SAM	TAL CAN

Client Sample ID: MW-77_021121
Lab Sample ID: 240-144515-4
Date Collected: 02/11/21 13:55
Matrix: Water
Date Received: 02/13/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473923	02/22/21 17:03	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		1	473720	02/19/21 18:44	SAM	TAL CAN

Client Sample ID: MW-96S_021121
Lab Sample ID: 240-144515-5
Date Collected: 02/11/21 15:22
Matrix: Water
Date Received: 02/13/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473923	02/22/21 17:25	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		1	473720	02/19/21 19:10	SAM	TAL CAN

Laboratory References:
TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144515-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

MICHIGAN 190 — TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No: 1 of 1 COCs
Phone: 248-994-2240	Sampler Name: Andrew Barth	TAT if different from below: ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day ☑	For lab use only: Walk-in client; Lab sampling; Job/SDG No:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	–	–		1						1					N	G	X	X	X	X	X	X	X	Trip Blank
MW-975_021121	2/11/21	1026		6						6					N	G	X	X	X	X	X	X	X	3 VOAs method 8260B 3 VOAs method 8260B SIM
MW-775_021121	2/11/21	1212		6						6					N	G	X	X	X	X	X	X	X	
MW-775-MS_021121	2/11/21	1212		6						6					N	G	X	X	X	X	X	X	X	
MW-775-MSD_021121	2/11/21	1212		6						6					N	G	X	X	X	X	X	X	X	
MW-77_021121	2/11/21	1355		6						6					N	G	X	X	X	X	X	X	X	
MW-965_021121	2/11/21	1522		6						6					N	G	X	X	X	X	X	X	X	

240-144515 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Andrew Barth	Arcadis	2/11/21 1730	Novi cold storage	Arcadis	2/11/21 1730
Julia McClafferty	Arcadis	2/12/2021	Amanda Battershell	ETA	2/12/21 10:05
Amanda Battershell	ETA	2/12/21 11:01	Received in Laboratory by:	Company:	Date/Time:
				ETA	2-13-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 144515**
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Ryan C

Cooler Received on 2-13-21 Opened on 2-13-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: ~~Bubble Wrap~~ Foam Plastic Bag None Other _____

COOLANT: ~~Wet Ice~~ Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.5 °C Corrected Cooler Temp. 1.6 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	~~Yes~~	No
-Were the seals on the outside of the cooler(s) signed & dated?	~~Yes~~	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	~~No~~
-Were tamper/custody seals intact and uncompromised?	~~Yes~~	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	~~No~~
4. Did custody papers accompany the sample(s)?	~~Yes~~	No
5. Were the custody papers relinquished & signed in the appropriate place?	~~Yes~~	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	~~Yes~~	No
7. Did all bottles arrive in good condition (Unbroken)?	~~Yes~~	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	~~Yes~~	No
9. For each sample, does the COC specify preservatives (~~Y~~/N), # of containers (~~Y~~/N), and sample type of grab/comp(~~Y~~/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	~~Yes~~	No
11. Sufficient quantity received to perform indicated analyses?	~~Yes~~	No
12. Are these work share samples and all listed on the COC?	Yes	~~No~~
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No ~~NA~~ pH Strip Lot# **HC907861**
14. Were VOAs on the COC?	~~Yes~~	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	~~No~~ NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 59072	~~Yes~~	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	~~No~~

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page | Samples processed by:

_____

_____

_____

_____

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT



February 24, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144515-1
Sample date: 2021-02-11
Report received by CADENA: 2021-02-24
Initial Data Verification completed by CADENA: 2021-02-24
Number of Samples:5
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, MS/MSD Recovery, MS/MSD RPD, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144515-1

		Sample Name:	TRIP BLANK				MW-97S_021121				MW-77S_021121				MW-77_021121				MW-96S_021121			
		Lab Sample ID:	2401445151				2401445152				2401445153				2401445154				2401445155			
		Sample Date:	2/11/2021				2/11/2021				2/11/2021				2/11/2021				2/11/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC																					
OSW-8260B																					
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	0.56	1.0	ug/l	J	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim																					
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---	ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

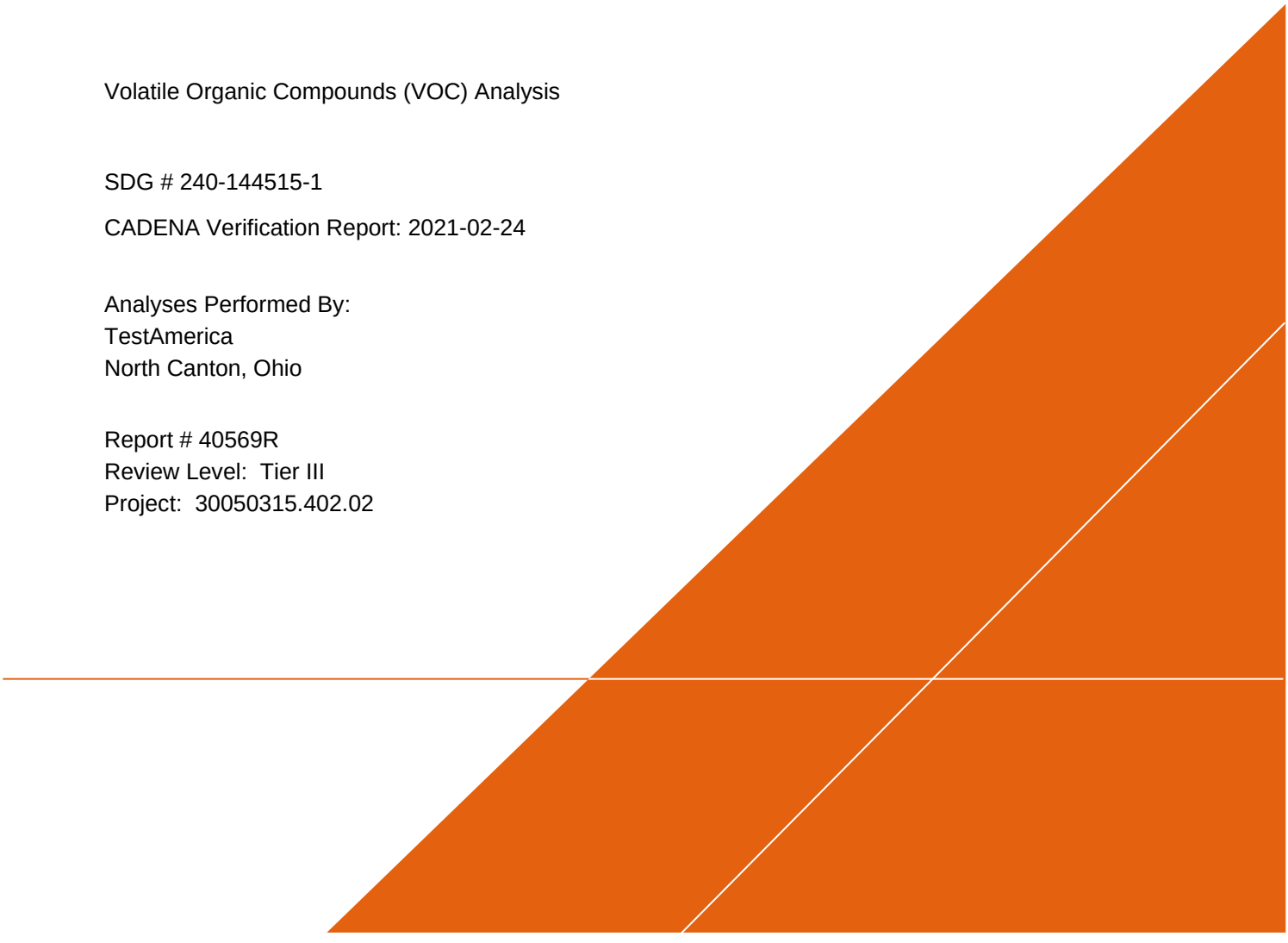
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144515-1

CADENA Verification Report: 2021-02-24

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40569R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144515-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144515-1	Water	02/11/2021		X	
MW-97S_021121	240-144515-2	Water	02/11/2021		X	X
MW-77S_021121	240-144515-3	Water	02/11/2021		X	X
MW-77_021121	240-144515-4	Water	02/11/2021		X	X
MW-96S_021121	240-144515-5	Water	02/11/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

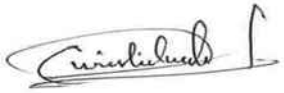
%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 17, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190 — TestAmerica

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Andrew Bartt	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	Trip Blank
MW-975_021121	2/11/21	1026		6						6					N	G	X	X	X	X	X	X	X	3 VOAs method 8260B 3 VOAs method 8260B SIM
MW-775_021121	2/11/21	1212		6						6					N	G	X	X	X	X	X	X	X	
MW-775-MS_021121	2/11/21	1212		6						6					N	G	X	X	X	X	X	X	X	
MW-775-MSD_021121	2/11/21	1212		6						6					N	G	X	X	X	X	X	X	X	
MW-77_021121	2/11/21	1355		6						6					N	G	X	X	X	X	X	X	X	
MW-965_021121	2/11/21	1522		6						6					N	G	X	X	X	X	X	X	X	

240-144515 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retal: Return to Client; Disposal By Lab; A

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Andrew Bartt	Arcadis	2/11/21 1730	Novi cold storage	Arcadis	2/11/21 1730
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[illegible] McClafferty	Arcadis	2/12/2021	Amanda Battershell	ETA	2/12/21 10.05
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
Amanda Battershell	ETA	2/12/21 11:01	[illegible]	ETA	2-13-21 800

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02/24/2021

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144515-1

Date Collected: 02/11/21 00:00
Date Received: 02/13/21 08:00

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 15:56	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 15:56	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 15:56	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 15:56	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 15:56	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/22/21 15:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*75 - 130*		*02/22/21 15:56*	*1*
4-Bromofluorobenzene (Surr)	*111*		*47 - 134*		*02/22/21 15:56*	*1*
Toluene-d8 (Surr)	*105*		*69 - 122*		*02/22/21 15:56*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*02/22/21 15:56*	*1*

Client Sample ID: MW-97S_021121

Lab Sample ID: 240-144515-2

Date Collected: 02/11/21 10:26
Date Received: 02/13/21 08:00

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/19/21 17:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*		*02/19/21 17:03*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 16:18	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 16:18	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 16:18	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 16:18	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 16:18	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/22/21 16:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*75 - 130*		*02/22/21 16:18*	*1*
4-Bromofluorobenzene (Surr)	*116*		*47 - 134*		*02/22/21 16:18*	*1*
Toluene-d8 (Surr)	*108*		*69 - 122*		*02/22/21 16:18*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*02/22/21 16:18*	*1*

Client Sample ID: MW-77S_021121

Lab Sample ID: 240-144515-3

Date Collected: 02/11/21 12:12
Date Received: 02/13/21 08:00

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/19/21 17:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*		*02/19/21 17:28*	*1*

Client Sample ID: MW-77S_021121
Lab Sample ID: 240-144515-3
Date Collected: 02/11/21 12:12
Matrix: Water
Date Received: 02/13/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 16:40	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 16:40	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 16:40	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 16:40	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 16:40	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/22/21 16:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*75 - 130*		*02/22/21 16:40*	*1*
4-Bromofluorobenzene (Surr)	*115*		*47 - 134*		*02/22/21 16:40*	*1*
Toluene-d8 (Surr)	*107*		*69 - 122*		*02/22/21 16:40*	*1*
Dibromofluoromethane (Surr)	*100*		*78 - 129*		*02/22/21 16:40*	*1*

Client Sample ID: MW-77_021121
Lab Sample ID: 240-144515-4
Date Collected: 02/11/21 13:55
Matrix: Water
Date Received: 02/13/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/19/21 18:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/19/21 18:44*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 17:03	1
cis-1,2-Dichloroethene	**0.56**	**J**	1.0	0.16	ug/L			02/22/21 17:03	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 17:03	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 17:03	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 17:03	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/22/21 17:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*75 - 130*		*02/22/21 17:03*	*1*
4-Bromofluorobenzene (Surr)	*115*		*47 - 134*		*02/22/21 17:03*	*1*
Toluene-d8 (Surr)	*108*		*69 - 122*		*02/22/21 17:03*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*02/22/21 17:03*	*1*

Client Sample ID: MW-96S_021121
Lab Sample ID: 240-144515-5
Date Collected: 02/11/21 15:22
Matrix: Water
Date Received: 02/13/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/19/21 19:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/19/21 19:10*	*1*

Client Sample ID: MW-96S_021121
Lab Sample ID: 240-144515-5
Date Collected: 02/11/21 15:22
Matrix: Water
Date Received: 02/13/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 17:25	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 17:25	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 17:25	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 17:25	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 17:25	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/22/21 17:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*75 - 130*		*02/22/21 17:25*	*1*
4-Bromofluorobenzene (Surr)	*110*		*47 - 134*		*02/22/21 17:25*	*1*
Toluene-d8 (Surr)	*104*		*69 - 122*		*02/22/21 17:25*	*1*
Dibromofluoromethane (Surr)	*95*		*78 - 129*		*02/22/21 17:25*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-145075-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/12/2021 4:32:44 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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Visit us at:
www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145075-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145075-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145075-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-145075-1	TRIP BLANK	Water	02/24/21 00:00	02/26/21 08:00	
240-145075-2	MW-78_022421	Water	02/24/21 10:15	02/26/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145075-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-145075-1

No Detections.

Client Sample ID: MW-78_022421 — Lab Sample ID: 240-145075-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	0.21	J	1.0	0.16	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145075-1

Client Sample ID: TRIP BLANK

Date Collected: 02/24/21 00:00
Date Received: 02/26/21 08:00

Lab Sample ID: 240-145075-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 15:33	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 15:33	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 15:33	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 15:33	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 15:33	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 15:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*75 - 130*		*03/03/21 15:33*	*1*
4-Bromofluorobenzene (Surr)	*76*		*47 - 134*		*03/03/21 15:33*	*1*
Toluene-d8 (Surr)	*85*		*69 - 122*		*03/03/21 15:33*	*1*
Dibromofluoromethane (Surr)	*110*		*78 - 129*		*03/03/21 15:33*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145075-1

Client Sample ID: MW-78_022421
Date Collected: 02/24/21 10:15
Date Received: 02/26/21 08:00

Lab Sample ID: 240-145075-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 20:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*70 - 133*		*03/01/21 20:08*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 15:55	1
cis-1,2-Dichloroethene	**0.21**	**J**	1.0	0.16	ug/L			03/03/21 15:55	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 15:55	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 15:55	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 15:55	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 15:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*75 - 130*		*03/03/21 15:55*	*1*
4-Bromofluorobenzene (Surr)	*76*		*47 - 134*		*03/03/21 15:55*	*1*
Toluene-d8 (Surr)	*85*		*69 - 122*		*03/03/21 15:55*	*1*
Dibromofluoromethane (Surr)	*116*		*78 - 129*		*03/03/21 15:55*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145075-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144838-B-2 MS	Matrix Spike	89	98	95	107
240-144838-B-2 MSD	Matrix Spike Duplicate	85	96	93	101
240-145075-1	TRIP BLANK	94	76	85	110
240-145075-2	MW-78_022421	99	76	85	116
LCS 240-475239/4	Lab Control Sample	87	95	93	103
MB 240-475239/7	Method Blank	92	79	88	103

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144807-J-4 MS	Matrix Spike	90
240-144807-J-4 MSD	Matrix Spike Duplicate	88
240-145075-2	MW-78_022421	95
LCS 240-474842/4	Lab Control Sample	90
MB 240-474842/5	Method Blank	86

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475239/7
Matrix: Water
Analysis Batch: 475239

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 11:11	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 11:11	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 11:11	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 11:11	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 11:11	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 11:11	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*		*03/03/21 11:11*	*1*
4-Bromofluorobenzene (Surr)	*79*		*47 - 134*		*03/03/21 11:11*	*1*
Toluene-d8 (Surr)	*88*		*69 - 122*		*03/03/21 11:11*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*03/03/21 11:11*	*1*

Lab Sample ID: LCS 240-475239/4
Matrix: Water
Analysis Batch: 475239

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	12.8		ug/L		128	73 - 129
cis-1,2-Dichloroethene	10.0	11.1		ug/L		111	75 - 124
Tetrachloroethene	10.0	10.5		ug/L		105	70 - 125
trans-1,2-Dichloroethene	10.0	11.0		ug/L		110	74 - 130
Trichloroethene	10.0	10.2		ug/L		102	71 - 121
Vinyl chloride	10.0	11.0		ug/L		110	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*103*		*78 - 129*

Lab Sample ID: 240-144838-B-2 MS
Matrix: Water
Analysis Batch: 475239

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*75 - 130*
4-Bromofluorobenzene (Surr)	*98*		*47 - 134*
Toluene-d8 (Surr)	*95*		*69 - 122*
Dibromofluoromethane (Surr)	*107*		*78 - 129*

Lab Sample ID: 240-144838-B-2 MSD
Matrix: Water
Analysis Batch: 475239

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*75 - 130*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144838-B-2 MSD
Matrix: Water
Analysis Batch: 475239

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Surrogate	MSD %Recovery	MSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*101*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474842/5
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 12:12	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*		*03/01/21 12:12*	*1*

Lab Sample ID: LCS 240-474842/4
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	9.05		ug/L		91	80 - 135		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*90*		*70 - 133*

Lab Sample ID: 240-144807-J-4 MS
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	8.95		ug/L		90	46 - 170		

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*90*		*70 - 133*

Lab Sample ID: 240-144807-J-4 MSD
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.28		ug/L		93	46 - 170	4	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145075-1

GC/MS VOA

Analysis Batch: 474842

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-145075-2	MW-78_022421	Total/NA	Water	8260B SIM	
MB 240-474842/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474842/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144807-J-4 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144807-J-4 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 475239

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-145075-1	TRIP BLANK	Total/NA	Water	8260B	
240-145075-2	MW-78_022421	Total/NA	Water	8260B	
MB 240-475239/7	Method Blank	Total/NA	Water	8260B	
LCS 240-475239/4	Lab Control Sample	Total/NA	Water	8260B	
240-144838-B-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144838-B-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145075-1

Client Sample ID: TRIP BLANK
Date Collected: 02/24/21 00:00
Date Received: 02/26/21 08:00

Lab Sample ID: 240-145075-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475239	03/03/21 15:33	LEE	TAL CAN

Client Sample ID: MW-78_022421
Date Collected: 02/24/21 10:15
Date Received: 02/26/21 08:00

Lab Sample ID: 240-145075-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475239	03/03/21 15:55	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	474842	03/01/21 20:08	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145075-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

1-6117

Chain of Custody Record

MICHIGAN 190 TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ace / NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-78_022421	2/24/21	1015		6						6					N	G	X	X	X	X	X	X	X	3 vocs for 8260B 3 vocs for 8260B SIM

240-145075 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; ✓ Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Emma Witherspoon	Arcadis	2/24/21 1700	Novi Cold Storage	Arcadis	2/24/21 1700
Julia McClafferty	Arcadis	2/25/2021	Amanda Battershell	ETA	2/25/21 10:03
Amanda Battershell	ETA	2/25/21 1238	Received in Laboratory by: MJS ETA CANTON	Company: FEB 26 2021	Date/Time: 800

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3/12/2021

240-145075

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :**
Canton Facility

Client Arcadis Site Name

Cooler Received on FEB 26 2021 Opened on FEB 26 2021

Cooler unpacked by: MJS ETA CANTON

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # NA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam (Plastic Bag) None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.6 °C Corrected Cooler Temp. 1.7 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)? (Y) (Y) (Y)
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # NA (Yes) No
17. Was a LL Hg or Me Hg trip blank present? Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by: MJS ETA CANTON

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container.
Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.
Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

WI-NC-099

DATA VERIFICATION REPORT



March 12, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 145075-1
Sample date: 2021-02-24
Report received by CADENA: 2021-03-12
Initial Data Verification completed by CADENA: 2021-03-12
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

> The matrix spike/matrix spike duplicate (MS/MSD) analytes were not reported, because the analyte list for these samples did not match the analyte list for the MS/MSD parent sample.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 145075-1

		Sample Name:	TRIP BLANK				MW-78_022421			
		Lab Sample ID:	2401450751				2401450752			
		Sample Date:	2/24/2021				2/24/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	0.21	1.0	ug/l	J
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS Design & Consultancy for natural and built assets

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

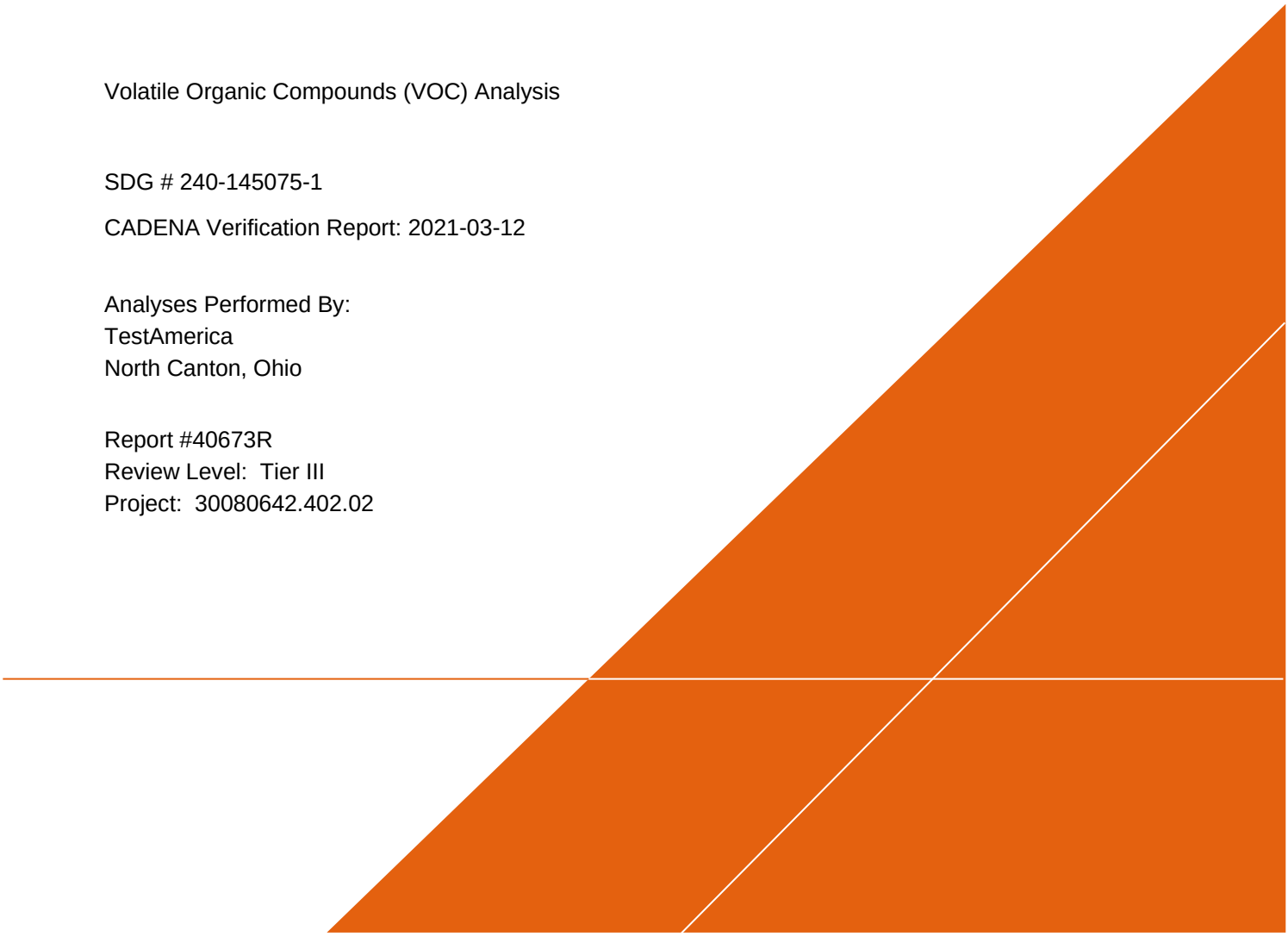
Volatile Organic Compounds (VOC) Analysis

SDG # 240-145075-1

CADENA Verification Report: 2021-03-12

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report #40673R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-145075-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					VOC
TRIP BLANK	240-145075-1	Water	02/24/2021		X
MW-78_022421	240-145075-2	Water	02/24/2021		X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Prashanth K

SIGNATURE: 

DATE: March 25, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 29, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

1-6117

Chain of Custody Record

MICHIGAN 190 TestAmerica

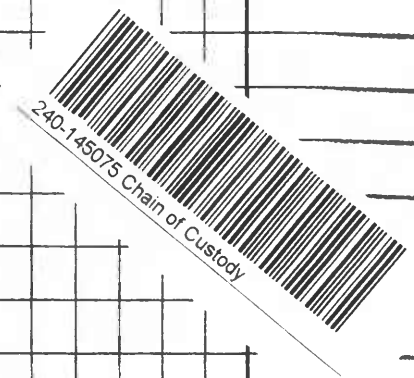
TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Acet/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-78_022421	2/24/21	1015		6						6					N	G	X	X	X	X	X	X	X	3 vocs for 8260B 3 vocs for 8260B SIM



Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Emma Witherspoon	Arcadis	2/24/21 1700	Novi Cold Storage	Arcadis	2/24/21 1700
Julia McClafferty	Arcadis	2/25/2021	Amanda Battershell	ETA	2/25/21 10:03
Amanda Battershell	ETA	2/25/21 1238	Received in Laboratory by: MJS ETA CANTON	Company: FEB 26 2021	Date/Time: 800

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03/12/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-145075-1

Date Collected: 02/24/21 00:00
Matrix: Water
Date Received: 02/26/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 15:33	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/03/21 15:33	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 15:33	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 15:33	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 15:33	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 15:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*75 - 130*		*03/03/21 15:33*	*1*
4-Bromofluorobenzene (Surr)	*76*		*47 - 134*		*03/03/21 15:33*	*1*
Toluene-d8 (Surr)	*85*		*69 - 122*		*03/03/21 15:33*	*1*
Dibromofluoromethane (Surr)	*110*		*78 - 129*		*03/03/21 15:33*	*1*

Client Sample ID: MW-78_022421
Lab Sample ID: 240-145075-2

Date Collected: 02/24/21 10:15
Matrix: Water
Date Received: 02/26/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 20:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*70 - 133*		*03/01/21 20:08*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 15:55	1
cis-1,2-Dichloroethene	**0.21**	**J**	1.0	0.16	ug/L			03/03/21 15:55	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/03/21 15:55	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/03/21 15:55	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/03/21 15:55	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/03/21 15:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*75 - 130*		*03/03/21 15:55*	*1*
4-Bromofluorobenzene (Surr)	*76*		*47 - 134*		*03/03/21 15:55*	*1*
Toluene-d8 (Surr)	*85*		*69 - 122*		*03/03/21 15:55*	*1*
Dibromofluoromethane (Surr)	*116*		*78 - 129*		*03/03/21 15:55*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144711-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/8/2021 11:02:24 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144711-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144711-1

Job ID: 240-144711-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144711-1

Comments
No additional comments.

Receipt
The samples were received on 2/20/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.7º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144711-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144711-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144711-1	TRIP BLANK	Water	02/18/21 00:00	02/20/21 08:00	
240-144711-2	MW-84_021821	Water	02/18/21 13:41	02/20/21 08:00	
240-144711-3	MW-84S_021821	Water	02/18/21 15:11	02/20/21 08:00	
240-144711-4	MW-78S_021821	Water	02/18/21 16:46	02/20/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144711-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144711-1

No Detections.

Client Sample ID: MW-84_021821 — Lab Sample ID: 240-144711-2

No Detections.

Client Sample ID: MW-84S_021821 — Lab Sample ID: 240-144711-3

No Detections.

Client Sample ID: MW-78S_021821 — Lab Sample ID: 240-144711-4

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144711-1

Client Sample ID: TRIP BLANK
Date Collected: 02/18/21 00:00
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144711-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 00:32	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 00:32	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 00:32	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 00:32	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 00:32	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 00:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*75 - 130*		*02/26/21 00:32*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*02/26/21 00:32*	*1*
Toluene-d8 (Surr)	*79*		*69 - 122*		*02/26/21 00:32*	*1*
Dibromofluoromethane (Surr)	*109*		*78 - 129*		*02/26/21 00:32*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144711-1

Client Sample ID: MW-84_021821
Date Collected: 02/18/21 13:41
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144711-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 13:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*70 - 133*		*02/26/21 13:48*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 00:55	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 00:55	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 00:55	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 00:55	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 00:55	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 00:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*109*		*75 - 130*		*02/26/21 00:55*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*02/26/21 00:55*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*02/26/21 00:55*	*1*
Dibromofluoromethane (Surr)	*115*		*78 - 129*		*02/26/21 00:55*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144711-1

Client Sample ID: MW-84S_021821
Date Collected: 02/18/21 15:11
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144711-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 15:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*70 - 133*		*02/26/21 15:04*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 02:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 02:07	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 02:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 02:07	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 02:07	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 02:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*75 - 130*		*02/26/21 02:07*	*1*
4-Bromofluorobenzene (Surr)	*68*		*47 - 134*		*02/26/21 02:07*	*1*
Toluene-d8 (Surr)	*82*		*69 - 122*		*02/26/21 02:07*	*1*
Dibromofluoromethane (Surr)	*106*		*78 - 129*		*02/26/21 02:07*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144711-1

Client Sample ID: MW-78S_021821
Date Collected: 02/18/21 16:46
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144711-4
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 15:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*70 - 133*		*02/26/21 15:29*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 16:03	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 16:03	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 16:03	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 16:03	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 16:03	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 16:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*02/26/21 16:03*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*02/26/21 16:03*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*02/26/21 16:03*	*1*
Dibromofluoromethane (Surr)	*105*		*78 - 129*		*02/26/21 16:03*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144711-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144710-E-5 MS	Matrix Spike	94	91	94	96
240-144710-F-5 MSD	Matrix Spike Duplicate	93	89	87	89
240-144711-1	TRIP BLANK	108	65	79	109
240-144711-2	MW-84_021821	109	65	80	115
240-144711-2 MS	MW-84-MS_021821	93	88	91	94
240-144711-2 MSD	MW-84-MSD_021821	91	92	91	92
240-144711-3	MW-84S_021821	106	68	82	106
240-144711-4	MW-78S_021821	104	65	80	105
LCS 240-474507/4	Lab Control Sample	88	88	88	91
LCS 240-474676/4	Lab Control Sample	87	93	92	89
MB 240-474507/7	Method Blank	102	68	80	101
MB 240-474676/7	Method Blank	104	68	83	102

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144711-2	MW-84_021821	91
240-144711-2 MS	MW-84-MS_021821	85
240-144711-2 MSD	MW-84-MSD_021821	86
240-144711-3	MW-84S_021821	91
240-144711-4	MW-78S_021821	92
LCS 240-474631/4	Lab Control Sample	82
MB 240-474631/5	Method Blank	80

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474507/7
Matrix: Water
Analysis Batch: 474507

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 17:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 17:22	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 17:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 17:22	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 17:22	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 17:22	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*75 - 130*		*02/25/21 17:22*	*1*
4-Bromofluorobenzene (Surr)	*68*		*47 - 134*		*02/25/21 17:22*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*02/25/21 17:22*	*1*
Dibromofluoromethane (Surr)	*101*		*78 - 129*		*02/25/21 17:22*	*1*

Lab Sample ID: LCS 240-474507/4
Matrix: Water
Analysis Batch: 474507

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.27		ug/L		93	73 - 129
cis-1,2-Dichloroethene	10.0	9.22		ug/L		92	75 - 124
Tetrachloroethene	10.0	11.5		ug/L		115	70 - 125
trans-1,2-Dichloroethene	10.0	9.77		ug/L		98	74 - 130
Trichloroethene	10.0	9.71		ug/L		97	71 - 121
Vinyl chloride	10.0	8.03		ug/L		80	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 130*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*
Toluene-d8 (Surr)	*88*		*69 - 122*
Dibromofluoromethane (Surr)	*91*		*78 - 129*

Lab Sample ID: 240-144711-2 MS
Matrix: Water
Analysis Batch: 474507

Client Sample ID: MW-84-MS_021821
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	8.83		ug/L		88	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	8.92		ug/L		89	68 - 121
Tetrachloroethene	1.0	U	10.0	11.2		ug/L		112	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.58		ug/L		96	69 - 126
Trichloroethene	1.0	U	10.0	9.00		ug/L		90	56 - 124
Vinyl chloride	1.0	U	10.0	8.39		ug/L		84	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*
Toluene-d8 (Surr)	*91*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144711-2 MS
Matrix: Water
Analysis Batch: 474507

Client Sample ID: MW-84-MS_021821
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	94		78 - 129

Lab Sample ID: 240-144711-2 MSD
Matrix: Water
Analysis Batch: 474507

Client Sample ID: MW-84-MSD_021821
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.03		ug/L		90	64 - 132	2	35
cis-1,2-Dichloroethene	1.0	U	10.0	9.44		ug/L		94	68 - 121	6	35
Tetrachloroethene	1.0	U	10.0	11.3		ug/L		113	52 - 129	1	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.55		ug/L		96	69 - 126	0	35
Trichloroethene	1.0	U	10.0	9.26		ug/L		93	56 - 124	3	35
Vinyl chloride	1.0	U	10.0	8.55		ug/L		86	49 - 136	2	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	91		75 - 130
4-Bromofluorobenzene (Surr)	92		47 - 134
Toluene-d8 (Surr)	91		69 - 122
Dibromofluoromethane (Surr)	92		78 - 129

Lab Sample ID: MB 240-474676/7
Matrix: Water
Analysis Batch: 474676

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 15:39	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 15:39	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 15:39	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 15:39	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 15:39	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 15:39	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	104		75 - 130		02/26/21 15:39	1
4-Bromofluorobenzene (Surr)	68		47 - 134		02/26/21 15:39	1
Toluene-d8 (Surr)	83		69 - 122		02/26/21 15:39	1
Dibromofluoromethane (Surr)	102		78 - 129		02/26/21 15:39	1

Lab Sample ID: LCS 240-474676/4
Matrix: Water
Analysis Batch: 474676

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.57		ug/L		96	73 - 129
cis-1,2-Dichloroethene	10.0	9.15		ug/L		91	75 - 124
Tetrachloroethene	10.0	12.0		ug/L		120	70 - 125
trans-1,2-Dichloroethene	10.0	10.1		ug/L		101	74 - 130
Trichloroethene	10.0	9.71		ug/L		97	71 - 121

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-474676/4
Matrix: Water
Analysis Batch: 474676

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Vinyl chloride			10.0	8.29		ug/L		83	61 - 134		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 130*
4-Bromofluorobenzene (Surr)	*93*		*47 - 134*
Toluene-d8 (Surr)	*92*		*69 - 122*
Dibromofluoromethane (Surr)	*89*		*78 - 129*

Lab Sample ID: 240-144710-E-5 MS
Matrix: Water
Analysis Batch: 474676

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,1-Dichloroethene	1.0	U	10.0	8.98		ug/L		90	64 - 132		
cis-1,2-Dichloroethene	4.2		10.0	13.3		ug/L		91	68 - 121		
Tetrachloroethene	1.0	U	10.0	10.6		ug/L		106	52 - 129		
trans-1,2-Dichloroethene	0.64	J	10.0	10.4		ug/L		98	69 - 126		
Trichloroethene	1.0	U	10.0	9.13		ug/L		91	56 - 124		
Vinyl chloride	14		10.0	20.4		ug/L		69	49 - 136		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*94*		*75 - 130*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*
Toluene-d8 (Surr)	*94*		*69 - 122*
Dibromofluoromethane (Surr)	*96*		*78 - 129*

Lab Sample ID: 240-144710-F-5 MSD
Matrix: Water
Analysis Batch: 474676

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.48		ug/L		95	64 - 132	5	35
cis-1,2-Dichloroethene	4.2		10.0	12.9		ug/L		87	68 - 121	3	35
Tetrachloroethene	1.0	U	10.0	10.9		ug/L		109	52 - 129	2	35
trans-1,2-Dichloroethene	0.64	J	10.0	10.3		ug/L		96	69 - 126	1	35
Trichloroethene	1.0	U	10.0	9.48		ug/L		95	56 - 124	4	35
Vinyl chloride	14		10.0	20.5		ug/L		70	49 - 136	1	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*
Toluene-d8 (Surr)	*87*		*69 - 122*
Dibromofluoromethane (Surr)	*89*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474631/5
Matrix: Water
Analysis Batch: 474631

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 10:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/26/21 10:51*	*1*

Lab Sample ID: LCS 240-474631/4
Matrix: Water
Analysis Batch: 474631

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	9.80		ug/L		98	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144711-2 MS
Matrix: Water
Analysis Batch: 474631

Client Sample ID: MW-84-MS_021821
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	9.26		ug/L		93	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*70 - 133*

Lab Sample ID: 240-144711-2 MSD
Matrix: Water
Analysis Batch: 474631

Client Sample ID: MW-84-MSD_021821
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.91		ug/L		99	46 - 170	7	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144711-1

GC/MS VOA

Analysis Batch: 474507

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144711-1	TRIP BLANK	Total/NA	Water	8260B	
240-144711-2	MW-84_021821	Total/NA	Water	8260B	
240-144711-3	MW-84S_021821	Total/NA	Water	8260B	
MB 240-474507/7	Method Blank	Total/NA	Water	8260B	
LCS 240-474507/4	Lab Control Sample	Total/NA	Water	8260B	
240-144711-2 MS	MW-84-MS_021821	Total/NA	Water	8260B	
240-144711-2 MSD	MW-84-MSD_021821	Total/NA	Water	8260B	

Analysis Batch: 474631

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144711-2	MW-84_021821	Total/NA	Water	8260B SIM	
240-144711-3	MW-84S_021821	Total/NA	Water	8260B SIM	
240-144711-4	MW-78S_021821	Total/NA	Water	8260B SIM	
MB 240-474631/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474631/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144711-2 MS	MW-84-MS_021821	Total/NA	Water	8260B SIM	
240-144711-2 MSD	MW-84-MSD_021821	Total/NA	Water	8260B SIM	

Analysis Batch: 474676

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144711-4	MW-78S_021821	Total/NA	Water	8260B	
MB 240-474676/7	Method Blank	Total/NA	Water	8260B	
LCS 240-474676/4	Lab Control Sample	Total/NA	Water	8260B	
240-144710-E-5 MS	Matrix Spike	Total/NA	Water	8260B	
240-144710-F-5 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144711-1

Client Sample ID: TRIP BLANK
Date Collected: 02/18/21 00:00
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144711-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474507	02/26/21 00:32	LRW	TAL CAN

Client Sample ID: MW-84_021821
Date Collected: 02/18/21 13:41
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144711-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474507	02/26/21 00:55	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474631	02/26/21 13:48	SAM	TAL CAN

Client Sample ID: MW-84S_021821
Date Collected: 02/18/21 15:11
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144711-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474507	02/26/21 02:07	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474631	02/26/21 15:04	SAM	TAL CAN

Client Sample ID: MW-78S_021821
Date Collected: 02/18/21 16:46
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144711-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474676	02/26/21 16:03	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474631	02/26/21 15:29	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144711-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

MICHIGAN 190 TestAmerica — THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Gary Schaefer	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day — 10 day		Walk-in client / Lab sampling
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30050315.402.04	Shipping/Tracking No:			
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/18/21	—		1						1							X	X	X	X	X	X	X	1 Trip Blank
MW-84-021821	02/18/21	13:41		X						6					N	G	X	X	X	X	X	X	X	Method 8260B Method 8260B SIM
MW-84-MS-021821	"	"		X						6					N	G	X	X	X	X	X	X	X	
MW-84-MSD-021821	"	"		X						6					N	G	X	X	X	X	X	X	X	
MW-845-021821	02/18/21	15:11		X						6					N	G	X	X	X	X	X	X	X	
MW-785-021821	02/18/21	16:46		X						6					N	G	X	X	X	X	X	X	X	

240-144711 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Return to Client ☐ Disposal By Lab ☐ Archive For ☐ Months (ined longer than 1 month)

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	2/19/21 9:20	Novi cold storage	Arcadis	02/19/21 9:20
Relinquished by: [signature]	Company: Arcadis	Date/Time: 2/19/21 10:11	Received by: [signature]	Company: ETA	Date/Time: 2/19/21 10:11
Relinquished by: [signature]	Company: ETA	Date/Time: 2/19/21 14:33	Received in Laboratory by: [signature]	Company: TA	Date/Time: 2/20/21 800

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3/8/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 44711
Canton Facility

Client Arcadis Site Name

Cooler Received on 2-20-21 Opened on 2-20-21

Cooler unpacked by:

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.6 °C Corrected Cooler Temp. 1.7 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
   -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? Yes No
11. Sufficient quantity received to perform indicated analyses? Yes No
12. Are these work share samples and all listed on the COC? Yes No
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC907861
14. Were VOAs on the COC? Yes No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # Yes No
17. Was a LL Hg or Me Hg trip blank present? Yes No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container.
Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.
Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

DATA VERIFICATION REPORT

March 08, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144711-1
Sample date: 2021-02-18
Report received by CADENA: 2021-03-08
Initial Data Verification completed by CADENA: 2021-03-08
Number of Samples:4
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, MS/MSD Recovery, MS/MSD RPD, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144711-1

		Sample Name:	TRIP BLANK				MW-84_021821				MW-84S_021821				MW-78S_021821			
		Lab Sample ID:	2401447111				2401447112				2401447113				2401447114			
		Sample Date:	2/18/2021				2/18/2021				2/18/2021				2/18/2021			
	Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC																		
	OSW-8260B																	
	1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	OSW-8260BBSim																	
	1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

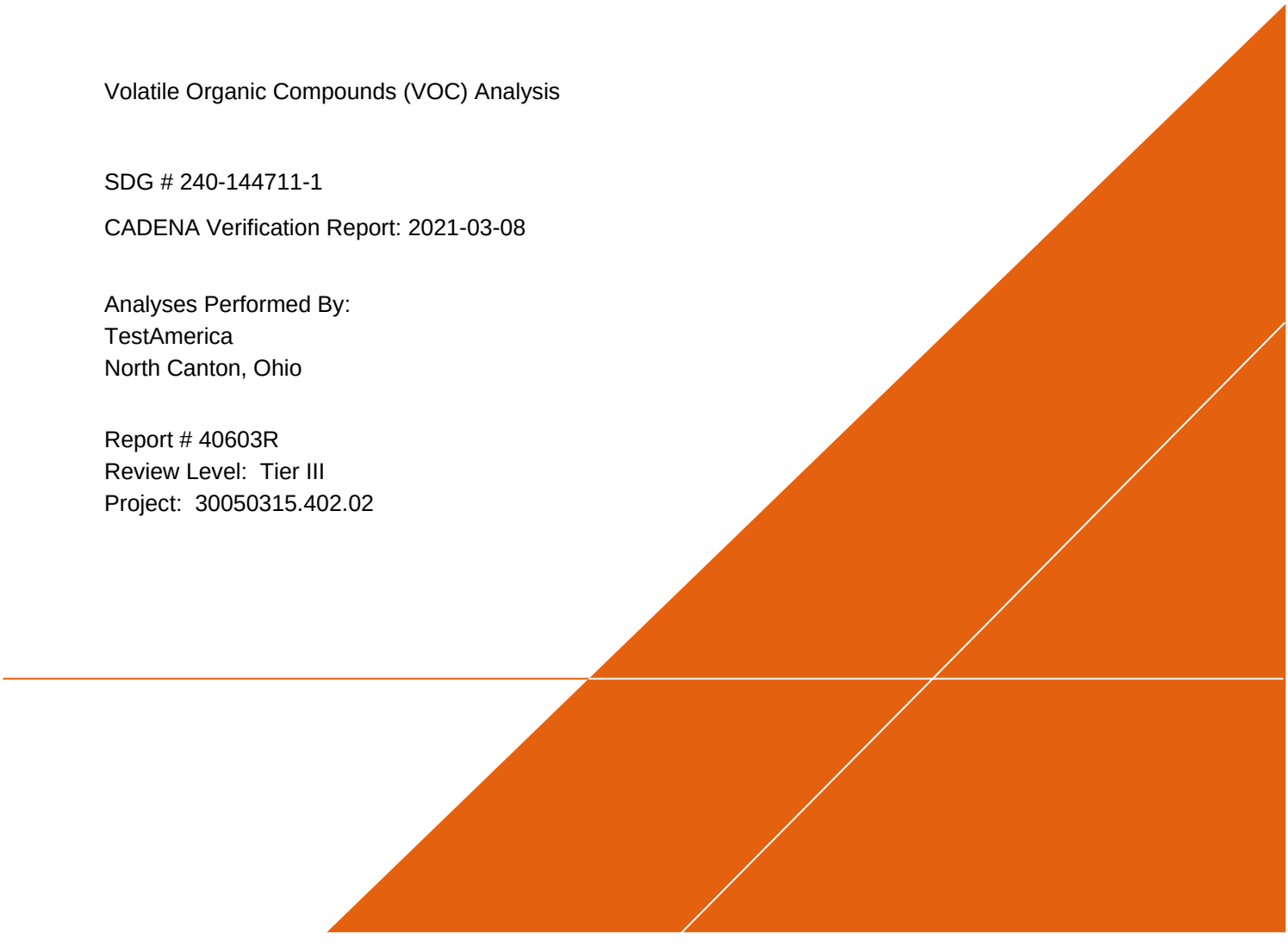
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144711-1

CADENA Verification Report: 2021-03-08

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40603R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144711-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144711-1	Water	02/18/2021		X	
MW-84_021821	240-144711-2	Water	02/18/2021		X	X
MW-84S_021821	240-144711-3	Water	02/18/2021		X	X
MW-78S_021821	240-144711-4	Water	02/18/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

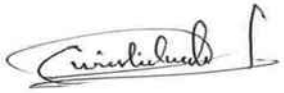
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 18, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 19, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190 TestAmerica — THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No: 1 of 1 COCs
Phone: 248-994-2240	Sampler Name: Gary Schaefer	TAT if different from below: ☐ 3 weeks ☐ 10 day ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day	For lab use only: Walk-in client; Lab sampling; Job/SDG No:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/18/21	—		|					1							X	X	X	X	X	X	X	1 Trip Blank
MW-84-021821	02/18/21	13:41		X						6					N	G	X	X	X	X	X	X	X	Method 8260B Method 8260B SIM
MW-84-MS-021821	"	"		X						6					N	G	X	X	X	X	X	X	X	
MW-84-MSD-021821	"	"		X						6					N	G	X	X	X	X	X	X	X	
MW-845-021821	02/18/21	15:11		X						6					N	G	X	X	X	X	X	X	X	
MW-785-021821	02/18/21	16:46		X						6					N	G	X	X	X	X	X	X	X	

240-144711 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

ined longer than 1 month) Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	2/19/21 9:20	Novi cold storage	Arcadis	2/19/21 9:20
[signature]	Arcadis	2/19/21 10:11	[signature]	ETA	2/19/21 10.11
[signature]	ETA	2/19/21 14:33	Received in Laboratory by: [signature]	TA	2-20-21 800

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03/08/2021

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144711-1

Date Collected: 02/18/21 00:00
Date Received: 02/20/21 08:00

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 00:32	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 00:32	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 00:32	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 00:32	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 00:32	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 00:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*75 - 130*		*02/26/21 00:32*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*02/26/21 00:32*	*1*
Toluene-d8 (Surr)	*79*		*69 - 122*		*02/26/21 00:32*	*1*
Dibromofluoromethane (Surr)	*109*		*78 - 129*		*02/26/21 00:32*	*1*

Client Sample ID: MW-84_021821

Lab Sample ID: 240-144711-2

Date Collected: 02/18/21 13:41
Date Received: 02/20/21 08:00

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 13:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*70 - 133*		*02/26/21 13:48*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 00:55	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 00:55	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 00:55	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 00:55	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 00:55	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 00:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*109*		*75 - 130*		*02/26/21 00:55*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*02/26/21 00:55*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*02/26/21 00:55*	*1*
Dibromofluoromethane (Surr)	*115*		*78 - 129*		*02/26/21 00:55*	*1*

Client Sample ID: MW-84S_021821

Lab Sample ID: 240-144711-3

Date Collected: 02/18/21 15:11
Date Received: 02/20/21 08:00

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 15:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*70 - 133*		*02/26/21 15:04*	*1*

Client Sample ID: MW-84S_021821
Lab Sample ID: 240-144711-3

Date Collected: 02/18/21 15:11
Matrix: Water
Date Received: 02/20/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 02:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 02:07	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 02:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 02:07	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 02:07	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 02:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*75 - 130*		*02/26/21 02:07*	*1*
4-Bromofluorobenzene (Surr)	*68*		*47 - 134*		*02/26/21 02:07*	*1*
Toluene-d8 (Surr)	*82*		*69 - 122*		*02/26/21 02:07*	*1*
Dibromofluoromethane (Surr)	*106*		*78 - 129*		*02/26/21 02:07*	*1*

Client Sample ID: MW-78S_021821
Lab Sample ID: 240-144711-4

Date Collected: 02/18/21 16:46
Matrix: Water
Date Received: 02/20/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 15:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*70 - 133*		*02/26/21 15:29*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 16:03	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 16:03	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 16:03	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 16:03	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 16:03	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 16:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*02/26/21 16:03*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*02/26/21 16:03*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*02/26/21 16:03*	*1*
Dibromofluoromethane (Surr)	*105*		*78 - 129*		*02/26/21 16:03*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144578-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
2/28/2021 2:07:22 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
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Have a Question? Ask The Expert
Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144578-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144578-1

Job ID: 240-144578-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144578-1

Comments
No additional comments.

Receipt
The samples were received on 2/17/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.1º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144578-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144578-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144578-1	TRIP BLANK	Water	02/12/21 00:00	02/17/21 08:00	
240-144578-2	MW-79D_021221	Water	02/12/21 10:46	02/17/21 08:00	
240-144578-3	MW-79SR_021221	Water	02/12/21 12:46	02/17/21 08:00	
240-144578-4	DUP-14	Water	02/12/21 00:00	02/17/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144578-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144578-1

No Detections.

Client Sample ID: MW-79D_021221 — Lab Sample ID: 240-144578-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	1.4		1.0	0.20	ug/L	1		8260B	Total/NA

Client Sample ID: MW-79SR_021221 — Lab Sample ID: 240-144578-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	0.83	J	1.0	0.20	ug/L	1		8260B	Total/NA

Client Sample ID: DUP-14 — Lab Sample ID: 240-144578-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	1.5		1.0	0.20	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144578-1

Client Sample ID: TRIP BLANK
Date Collected: 02/12/21 00:00
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144578-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 12:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 12:19	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 12:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 12:19	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 12:19	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 12:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*02/24/21 12:19*	*1*
4-Bromofluorobenzene (Surr)	*92*		*47 - 134*		*02/24/21 12:19*	*1*
Toluene-d8 (Surr)	*101*		*69 - 122*		*02/24/21 12:19*	*1*
Dibromofluoromethane (Surr)	*102*		*78 - 129*		*02/24/21 12:19*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144578-1

Client Sample ID: MW-79D_021221
Date Collected: 02/12/21 10:46
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144578-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 22:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/22/21 22:56*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 12:41	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 12:41	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 12:41	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 12:41	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 12:41	1
Vinyl chloride	**1.4**		1.0	0.20	ug/L			02/24/21 12:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*02/24/21 12:41*	*1*
4-Bromofluorobenzene (Surr)	*94*		*47 - 134*		*02/24/21 12:41*	*1*
Toluene-d8 (Surr)	*103*		*69 - 122*		*02/24/21 12:41*	*1*
Dibromofluoromethane (Surr)	*100*		*78 - 129*		*02/24/21 12:41*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144578-1

Client Sample ID: MW-79SR_021221
Date Collected: 02/12/21 12:46
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144578-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 23:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/22/21 23:21*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 13:04	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 13:04	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 13:04	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 13:04	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 13:04	1
Vinyl chloride	**0.83**	**J**	1.0	0.20	ug/L			02/24/21 13:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*02/24/21 13:04*	*1*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*		*02/24/21 13:04*	*1*
Toluene-d8 (Surr)	*105*		*69 - 122*		*02/24/21 13:04*	*1*
Dibromofluoromethane (Surr)	*101*		*78 - 129*		*02/24/21 13:04*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144578-1

Client Sample ID: DUP-14
Date Collected: 02/12/21 00:00
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144578-4
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 23:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/22/21 23:47*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 13:26	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 13:26	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 13:26	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 13:26	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 13:26	1
Vinyl chloride	**1.5**		1.0	0.20	ug/L			02/24/21 13:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*75 - 130*		*02/24/21 13:26*	*1*
4-Bromofluorobenzene (Surr)	*85*		*47 - 134*		*02/24/21 13:26*	*1*
Toluene-d8 (Surr)	*97*		*69 - 122*		*02/24/21 13:26*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*02/24/21 13:26*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144578-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144578-1	TRIP BLANK	104	92	101	102
240-144578-2	MW-79D_021221	100	94	103	100
240-144578-3	MW-79SR_021221	101	95	105	101
240-144578-4	DUP-14	99	85	97	98
240-144585-E-7 MS	Matrix Spike	96	91	97	100
240-144585-E-7 MSD	Matrix Spike Duplicate	101	98	105	103
LCS 240-474261/4	Lab Control Sample	93	91	98	95
MB 240-474261/6	Method Blank	102	93	105	100

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144576-G-2 MS	Matrix Spike	81
240-144576-G-2 MSD	Matrix Spike Duplicate	81
240-144578-2	MW-79D_021221	83
240-144578-3	MW-79SR_021221	82
240-144578-4	DUP-14	80
LCS 240-473970/4	Lab Control Sample	80
MB 240-473970/5	Method Blank	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474261/6
Matrix: Water
Analysis Batch: 474261

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 11:12	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 11:12	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 11:12	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 11:12	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 11:12	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 11:12	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*75 - 130*		*02/24/21 11:12*	*1*
4-Bromofluorobenzene (Surr)	*93*		*47 - 134*		*02/24/21 11:12*	*1*
Toluene-d8 (Surr)	*105*		*69 - 122*		*02/24/21 11:12*	*1*
Dibromofluoromethane (Surr)	*100*		*78 - 129*		*02/24/21 11:12*	*1*

Lab Sample ID: LCS 240-474261/4
Matrix: Water
Analysis Batch: 474261

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.2		ug/L		102	73 - 129
cis-1,2-Dichloroethene	10.0	9.76		ug/L		98	75 - 124
Tetrachloroethene	10.0	10.4		ug/L		104	70 - 125
trans-1,2-Dichloroethene	10.0	9.65		ug/L		97	74 - 130
Trichloroethene	10.0	10.1		ug/L		101	71 - 121
Vinyl chloride	10.0	9.62		ug/L		96	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*
Toluene-d8 (Surr)	*98*		*69 - 122*
Dibromofluoromethane (Surr)	*95*		*78 - 129*

Lab Sample ID: 240-144585-E-7 MS
Matrix: Water
Analysis Batch: 474261

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	17	U	167	148		ug/L		89	64 - 132
cis-1,2-Dichloroethene	260		167	407		ug/L		90	68 - 121
Tetrachloroethene	17	U	167	148		ug/L		89	52 - 129
trans-1,2-Dichloroethene	17	U	167	161		ug/L		96	69 - 126
Trichloroethene	17	U	167	149		ug/L		89	56 - 124
Vinyl chloride	460		167	594		ug/L		78	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*96*		*75 - 130*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*
Toluene-d8 (Surr)	*97*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144585-E-7 MS
Matrix: Water
Analysis Batch: 474261

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*100*		*78 - 129*

Lab Sample ID: 240-144585-E-7 MSD
Matrix: Water
Analysis Batch: 474261

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	17	U	167	167		ug/L		100	64 - 132	12	35
cis-1,2-Dichloroethene	260		167	426		ug/L		101	68 - 121	5	35
Tetrachloroethene	17	U	167	165		ug/L		99	52 - 129	11	35
trans-1,2-Dichloroethene	17	U	167	168		ug/L		101	69 - 126	4	35
Trichloroethene	17	U	167	166		ug/L		99	56 - 124	11	35
Vinyl chloride	460		167	625		ug/L		96	49 - 136	5	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*
4-Bromofluorobenzene (Surr)	*98*		*47 - 134*
Toluene-d8 (Surr)	*105*		*69 - 122*
Dibromofluoromethane (Surr)	*103*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473970/5
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 14:03	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/22/21 14:03*	*1*

Lab Sample ID: LCS 240-473970/4
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.3		ug/L		103	80 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*

Lab Sample ID: 240-144576-G-2 MS
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	10.7		ug/L		107	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

Lab Sample ID: 240-144576-G-2 MSD
Matrix: Water
Analysis Batch: 473970

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	11.1		ug/L		111	46 - 170	4	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144578-1

GC/MS VOA

Analysis Batch: 473970

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144578-2	MW-79D_021221	Total/NA	Water	8260B SIM	
240-144578-3	MW-79SR_021221	Total/NA	Water	8260B SIM	
240-144578-4	DUP-14	Total/NA	Water	8260B SIM	
MB 240-473970/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-473970/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144576-G-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144576-G-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474261

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144578-1	TRIP BLANK	Total/NA	Water	8260B	
240-144578-2	MW-79D_021221	Total/NA	Water	8260B	
240-144578-3	MW-79SR_021221	Total/NA	Water	8260B	
240-144578-4	DUP-14	Total/NA	Water	8260B	
MB 240-474261/6	Method Blank	Total/NA	Water	8260B	
LCS 240-474261/4	Lab Control Sample	Total/NA	Water	8260B	
240-144585-E-7 MS	Matrix Spike	Total/NA	Water	8260B	
240-144585-E-7 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144578-1

Client Sample ID: TRIP BLANK
Date Collected: 02/12/21 00:00
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144578-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474261	02/24/21 12:19	LEE	TAL CAN

Client Sample ID: MW-79D_021221
Date Collected: 02/12/21 10:46
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144578-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474261	02/24/21 12:41	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	473970	02/22/21 22:56	SAM	TAL CAN

Client Sample ID: MW-79SR_021221
Date Collected: 02/12/21 12:46
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144578-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474261	02/24/21 13:04	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	473970	02/22/21 23:21	SAM	TAL CAN

Client Sample ID: DUP-14
Date Collected: 02/12/21 00:00
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144578-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474261	02/24/21 13:26	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	473970	02/22/21 23:47	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144578-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

TestAmerica MICHIGAN 190

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW — NPDES — RCRA — Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI. 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No: 1 of 1 COCs
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day	For lab use only: Walk-in client; Lab sampling; Job/SDG No:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAcet NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/12/21	—		X						1					N	G	X	X	X	X	X	X	X	TRIP BLANK
MW-79D-021221	02/12/21	10:46		X						6					N	G	X	X	X	X	X	X	X	3 VOAS METHOD 8260B
MW-79SR-021221	02/12/21	12:46		X						6					N	G	X	X	X	X	X	X	X	3 VOAS METHOD 8260B SIM
DUP-14	02/12/21	—		X						6					N	G	X	X	X	X	X	X	X	↓

240-144578 Chain of Custody

Possible Hazard Identification: Non-Hazard — Flammable — Skin Irritant — Poison B — Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client — Disposal By Lab — Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	02/13/21 1619	No: cold storage	Arcadis	02/13/21 1619
[signature]	ARCADIS	2/15/21 / 1010	[signature]	ETA	2/15/21 / 1010
Amanda Bathelt	ETA	2/15/21 10:57	Received in Laboratory by:	Company:	Date/Time:

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COLD STORAGE ETA 2/15/21 1057

Amanda Bathelt ETA 2/16/21 907 [signature] 2-17-21 ETA 800

2/28/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 144578**
Canton Facility

Client Arcadis Site Name

Cooler Received on 2-17-21 Opened on 2-17-21

Cooler unpacked by: MathSnyder

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 4.0 °C Corrected Cooler Temp. 4.1 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity ____	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	(Yes)	No
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No	(NA) pH Strip Lot# HC907861
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ____	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT



February 28, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144578-1
Sample date: 2021-02-12
Report received by CADENA: 2021-02-28
Initial Data Verification completed by CADENA: 2021-02-28
Number of Samples:4
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144578-1

		Sample Name:	TRIP BLANK				MW-79D_021221				MW-79SR_021221				DUP-14			
		Lab Sample ID:	2401445781				2401445782				2401445783				2401445784			
		Sample Date:	2/12/2021				2/12/2021				2/12/2021				2/12/2021			
	Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC																		
	OSW-8260B																	
	1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Vinyl chloride	75-01-4	ND	1.0	ug/l	---	1.4	1.0	ug/l	---	0.83	1.0	ug/l	J	1.5	1.0	ug/l	---
	OSW-8260BBSim																	
	1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

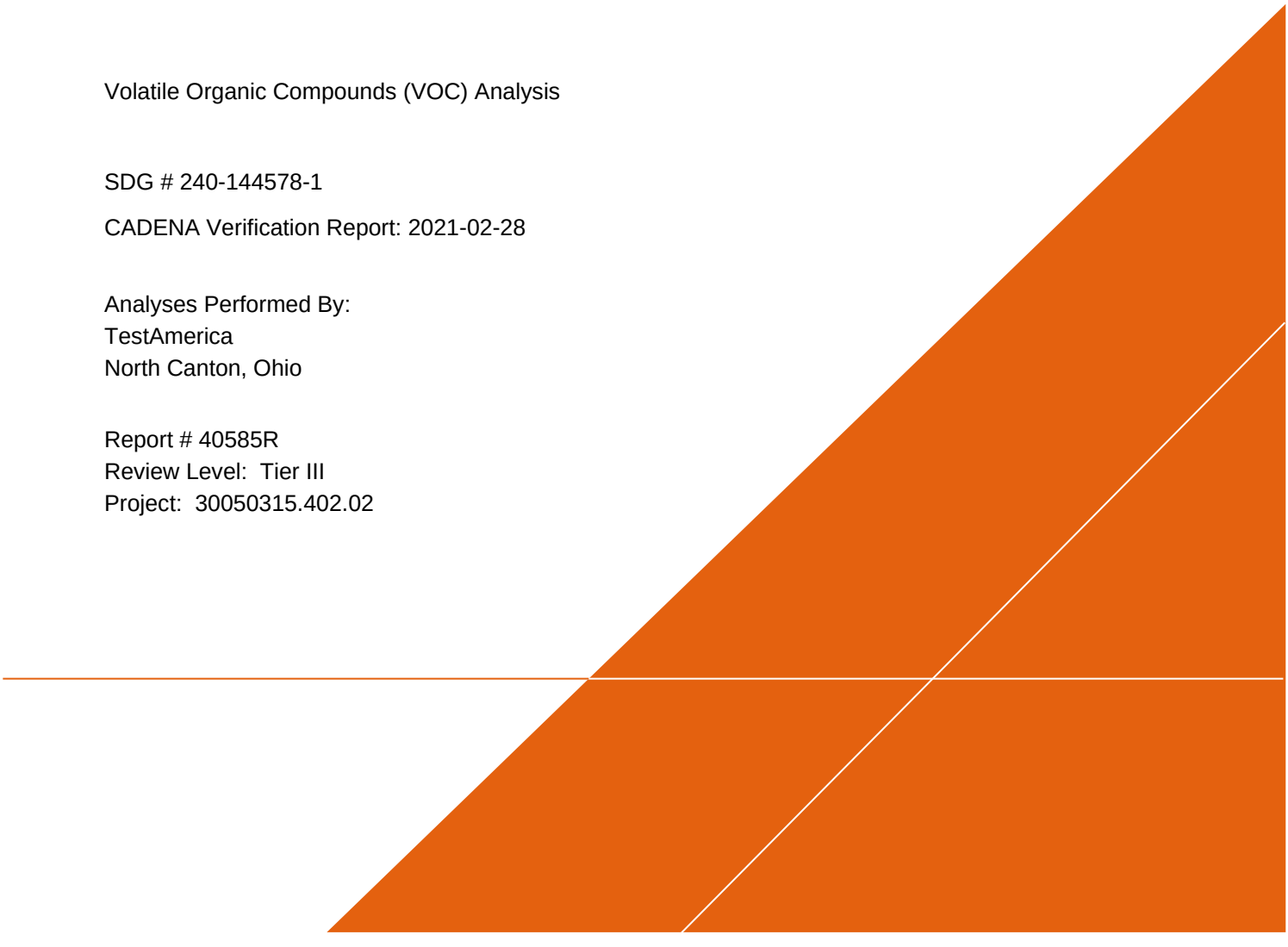
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144578-1

CADENA Verification Report: 2021-02-28

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40585R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144578-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144578-1	Water	02/12/2021		X	
MW-79D_021221	240-144578-2	Water	02/12/2021		X	X
MW-79SR_021221	240-144578-3	Water	02/12/2021		X	X
DUP-14	240-144578-4	Water	02/12/2021	MW-79D_021221	X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result (µg/L)	Duplicate Result (µg/L)	RPD
MW-79D_021221 / DUP-14	Vinyl chloride	1.4	1.5	AC

Notes:

AC – Acceptable

The calculated differences between the parent sample and field duplicate were acceptable.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

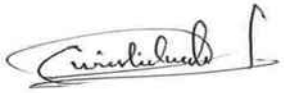
%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 17, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 18, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica

MICHIGAN 190

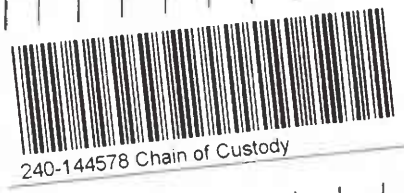
TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI. 48377	Sampler Name: Gary Schafer	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/12/21	—		X						1					N	G	X	X	X	X	X	X	X	TRIP BLANK
MW-79D-021221	02/12/21	10:46		X						6					N	G	X	X	X	X	X	X	X	3 VOAS METHOD 8260B
MW-79SR-021221	02/12/21	12:46		X						6					N	G	X	X	X	X	X	X	X	3 VOAS METHOD 8260B SIM
DUP-14	02/12/21	—		X						6					N	G	X	X	X	X	X	X	X	↓



Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	02/13/21 1619	No. 1 cold storage	Arcadis	02/13/21 1619
[signature]	ARCADIS	2/15/21 / 1010	[signature]	ETA	2/15/21 / 1010
Amanda Battenfield	ETA	2/15/21 10:57	Received in Laboratory by:	Company:	Date/Time:

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COLD STORAGE ETA 2/15/21 1057

Amanda Battenfield ETA 2/16/21 907 [signature] 2-17-21 ETA 800

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144578-1
Date Collected: 02/12/21 00:00
Matrix: Water
Date Received: 02/17/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 12:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 12:19	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 12:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 12:19	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 12:19	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 12:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*02/24/21 12:19*	*1*
4-Bromofluorobenzene (Surr)	*92*		*47 - 134*		*02/24/21 12:19*	*1*
Toluene-d8 (Surr)	*101*		*69 - 122*		*02/24/21 12:19*	*1*
Dibromofluoromethane (Surr)	*102*		*78 - 129*		*02/24/21 12:19*	*1*

Client Sample ID: MW-79D_021221
Lab Sample ID: 240-144578-2
Date Collected: 02/12/21 10:46
Matrix: Water
Date Received: 02/17/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 22:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/22/21 22:56*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 12:41	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 12:41	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 12:41	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 12:41	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 12:41	1
Vinyl chloride	**1.4**		1.0	0.20	ug/L			02/24/21 12:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*75 - 130*		*02/24/21 12:41*	*1*
4-Bromofluorobenzene (Surr)	*94*		*47 - 134*		*02/24/21 12:41*	*1*
Toluene-d8 (Surr)	*103*		*69 - 122*		*02/24/21 12:41*	*1*
Dibromofluoromethane (Surr)	*100*		*78 - 129*		*02/24/21 12:41*	*1*

Client Sample ID: MW-79SR_021221
Lab Sample ID: 240-144578-3
Date Collected: 02/12/21 12:46
Matrix: Water
Date Received: 02/17/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 23:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/22/21 23:21*	*1*

Client Sample ID: MW-79SR_021221
Lab Sample ID: 240-144578-3
Date Collected: 02/12/21 12:46
Matrix: Water
Date Received: 02/17/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 13:04	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 13:04	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 13:04	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 13:04	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 13:04	1
Vinyl chloride	**0.83**	**J**	1.0	0.20	ug/L			02/24/21 13:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*02/24/21 13:04*	*1*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*		*02/24/21 13:04*	*1*
Toluene-d8 (Surr)	*105*		*69 - 122*		*02/24/21 13:04*	*1*
Dibromofluoromethane (Surr)	*101*		*78 - 129*		*02/24/21 13:04*	*1*

Client Sample ID: DUP-14
Lab Sample ID: 240-144578-4
Date Collected: 02/12/21 00:00
Matrix: Water
Date Received: 02/17/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/22/21 23:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/22/21 23:47*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 13:26	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 13:26	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 13:26	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 13:26	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 13:26	1
Vinyl chloride	**1.5**		1.0	0.20	ug/L			02/24/21 13:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*75 - 130*		*02/24/21 13:26*	*1*
4-Bromofluorobenzene (Surr)	*85*		*47 - 134*		*02/24/21 13:26*	*1*
Toluene-d8 (Surr)	*97*		*69 - 122*		*02/24/21 13:26*	*1*
Dibromofluoromethane (Surr)	*98*		*78 - 129*		*02/24/21 13:26*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144436-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
2/24/2021 11:22:45 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144436-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
F1	MS and/or MSD recovery exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144436-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144436-1

Comments
No additional comments.

Receipt
The samples were received on 2/12/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.4º C.

GC/MS VOA
Method 8260B: The continuing calibration verification (CCV) associated with batch 473553 recovered above the upper control limit for 1,1-Dichloroethene. The samples associated with this CCV were non-detect for the affected analyte; therefore, the data have been reported. The associated samples are impacted: TRIP BLANK (240-144436-1), DUP-08 (240-144436-2), MW-80SR_021021 (240-144436-3) and MW-137S_021021 (240-144436-4).

Method 8260B: The laboratory control sample (LCS) for 473553 recovered outside control limits for the following analyte: 1,1-Dichloroethene. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported: TRIP BLANK (240-144436-1), DUP-08 (240-144436-2), MW-80SR_021021 (240-144436-3), MW-137S_021021 (240-144436-4) and (LCS 240-473553/4).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144436-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144436-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144436-1	TRIP BLANK	Water	02/10/21 00:00	02/12/21 08:00	
240-144436-2	DUP-08	Water	02/10/21 00:00	02/12/21 08:00	
240-144436-3	MW-80SR_021021	Water	02/10/21 10:45	02/12/21 08:00	
240-144436-4	MW-137S_021021	Water	02/10/21 12:00	02/12/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144436-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144436-1

No Detections.

Client Sample ID: DUP-08 — Lab Sample ID: 240-144436-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	1.8		1.0	0.20	ug/L	1		8260B	Total/NA

Client Sample ID: MW-80SR_021021 — Lab Sample ID: 240-144436-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	1.6		1.0	0.20	ug/L	1		8260B	Total/NA

Client Sample ID: MW-137S_021021 — Lab Sample ID: 240-144436-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	0.33	J	1.0	0.20	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144436-1

Client Sample ID: TRIP BLANK
Date Collected: 02/10/21 00:00
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144436-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/18/21 14:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/18/21 14:46	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/18/21 14:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 14:46	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/18/21 14:46	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/18/21 14:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*123*		*75 - 130*		*02/18/21 14:46*	*1*
4-Bromofluorobenzene (Surr)	*84*		*47 - 134*		*02/18/21 14:46*	*1*
Toluene-d8 (Surr)	*88*		*69 - 122*		*02/18/21 14:46*	*1*
Dibromofluoromethane (Surr)	*111*		*78 - 129*		*02/18/21 14:46*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144436-1

Client Sample ID: DUP-08
Date Collected: 02/10/21 00:00
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144436-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/17/21 12:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/17/21 12:30*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/18/21 15:08	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/18/21 15:08	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/18/21 15:08	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 15:08	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/18/21 15:08	1
Vinyl chloride	**1.8**		1.0	0.20	ug/L			02/18/21 15:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*125*		*75 - 130*		*02/18/21 15:08*	*1*
4-Bromofluorobenzene (Surr)	*80*		*47 - 134*		*02/18/21 15:08*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*02/18/21 15:08*	*1*
Dibromofluoromethane (Surr)	*109*		*78 - 129*		*02/18/21 15:08*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144436-1

Client Sample ID: MW-80SR_021021
Date Collected: 02/10/21 10:45
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144436-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/17/21 12:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/17/21 12:55*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/18/21 15:30	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/18/21 15:30	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/18/21 15:30	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 15:30	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/18/21 15:30	1
Vinyl chloride	**1.6**		1.0	0.20	ug/L			02/18/21 15:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*123*		*75 - 130*		*02/18/21 15:30*	*1*
4-Bromofluorobenzene (Surr)	*79*		*47 - 134*		*02/18/21 15:30*	*1*
Toluene-d8 (Surr)	*88*		*69 - 122*		*02/18/21 15:30*	*1*
Dibromofluoromethane (Surr)	*106*		*78 - 129*		*02/18/21 15:30*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144436-1

Client Sample ID: MW-137S_021021
Date Collected: 02/10/21 12:00
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144436-4
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/17/21 13:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/17/21 13:21*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/18/21 15:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/18/21 15:52	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/18/21 15:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 15:52	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/18/21 15:52	1
Vinyl chloride	**0.33**	**J**	1.0	0.20	ug/L			02/18/21 15:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*121*		*75 - 130*		*02/18/21 15:52*	*1*
4-Bromofluorobenzene (Surr)	*80*		*47 - 134*		*02/18/21 15:52*	*1*
Toluene-d8 (Surr)	*87*		*69 - 122*		*02/18/21 15:52*	*1*
Dibromofluoromethane (Surr)	*108*		*78 - 129*		*02/18/21 15:52*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144436-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144436-1	TRIP BLANK	123	84	88	111
240-144436-2	DUP-08	125	80	90	109
240-144436-3	MW-80SR_021021	123	79	88	106
240-144436-4	MW-137S_021021	121	80	87	108
240-144460-B-2 MS	Matrix Spike	111	110	100	102
240-144460-B-2 MSD	Matrix Spike Duplicate	104	107	99	95
LCS 240-473553/4	Lab Control Sample	105	107	96	95
MB 240-473553/7	Method Blank	116	86	91	101

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144436-2	DUP-08	81
240-144436-3	MW-80SR_021021	82
240-144436-4	MW-137S_021021	82
240-144439-A-3 MS	Matrix Spike	84
240-144439-A-3 MSD	Matrix Spike Duplicate	85
LCS 240-473381/4	Lab Control Sample	80
MB 240-473381/5	Method Blank	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473553/7
Matrix: Water
Analysis Batch: 473553

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 12:13	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/18/21 12:13	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/18/21 12:13	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 12:13	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/18/21 12:13	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/18/21 12:13	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*75 - 130*		*02/18/21 12:13*	*1*
4-Bromofluorobenzene (Surr)	*86*		*47 - 134*		*02/18/21 12:13*	*1*
Toluene-d8 (Surr)	*91*		*69 - 122*		*02/18/21 12:13*	*1*
Dibromofluoromethane (Surr)	*101*		*78 - 129*		*02/18/21 12:13*	*1*

Lab Sample ID: LCS 240-473553/4
Matrix: Water
Analysis Batch: 473553

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	17.3	*+	ug/L		173	73 - 129
cis-1,2-Dichloroethene	10.0	9.52		ug/L		95	75 - 124
Tetrachloroethene	10.0	9.34		ug/L		93	70 - 125
trans-1,2-Dichloroethene	10.0	9.59		ug/L		96	74 - 130
Trichloroethene	10.0	9.06		ug/L		91	71 - 121
Vinyl chloride	10.0	8.30		ug/L		83	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*105*		*75 - 130*
4-Bromofluorobenzene (Surr)	*107*		*47 - 134*
Toluene-d8 (Surr)	*96*		*69 - 122*
Dibromofluoromethane (Surr)	*95*		*78 - 129*

Lab Sample ID: 240-144460-B-2 MS
Matrix: Water
Analysis Batch: 473553

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	2500	U F1 *+	25000	35500	F1	ug/L		142	64 - 132
cis-1,2-Dichloroethene	2900		25000	25500		ug/L		91	68 - 121
Tetrachloroethene	2500	U	25000	21400		ug/L		86	52 - 129
Trichloroethene	50000		25000	65000		ug/L		59	56 - 124
Vinyl chloride	2500	U	25000	15800		ug/L		63	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*111*		*75 - 130*
4-Bromofluorobenzene (Surr)	*110*		*47 - 134*
Toluene-d8 (Surr)	*100*		*69 - 122*
Dibromofluoromethane (Surr)	*102*		*78 - 129*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144460-B-2 MSD
Matrix: Water
Analysis Batch: 473553

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	2500	U F1 *+	25000	38200	F1	ug/L		153	64 - 132	7	35
cis-1,2-Dichloroethene	2900		25000	26200		ug/L		93	68 - 121	2	35
Tetrachloroethene	2500	U	25000	24000		ug/L		96	52 - 129	12	35
Trichloroethene	50000		25000	65000		ug/L		59	56 - 124	0	35
Vinyl chloride	2500	U	25000	18200		ug/L		73	49 - 136	14	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*
4-Bromofluorobenzene (Surr)	*107*		*47 - 134*
Toluene-d8 (Surr)	*99*		*69 - 122*
Dibromofluoromethane (Surr)	*95*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473381/5
Matrix: Water
Analysis Batch: 473381

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/17/21 09:33	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/17/21 09:33*	*1*

Lab Sample ID: LCS 240-473381/4
Matrix: Water
Analysis Batch: 473381

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.8		ug/L		108	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*

Lab Sample ID: 240-144439-A-3 MS
Matrix: Water
Analysis Batch: 473381

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	34		10.0	43.3		ug/L		91	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144439-A-3 MSD
Matrix: Water
Analysis Batch: 473381

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	34		10.0	42.6		ug/L		83	46 - 170	2	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144436-1

GC/MS VOA

Analysis Batch: 473381

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144436-2	DUP-08	Total/NA	Water	8260B SIM	
240-144436-3	MW-80SR_021021	Total/NA	Water	8260B SIM	
240-144436-4	MW-137S_021021	Total/NA	Water	8260B SIM	
MB 240-473381/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-473381/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144439-A-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144439-A-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 473553

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144436-1	TRIP BLANK	Total/NA	Water	8260B	
240-144436-2	DUP-08	Total/NA	Water	8260B	
240-144436-3	MW-80SR_021021	Total/NA	Water	8260B	
240-144436-4	MW-137S_021021	Total/NA	Water	8260B	
MB 240-473553/7	Method Blank	Total/NA	Water	8260B	
LCS 240-473553/4	Lab Control Sample	Total/NA	Water	8260B	
240-144460-B-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144460-B-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144436-1

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144436-1
Date Collected: 02/10/21 00:00
Matrix: Water
Date Received: 02/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473553	02/18/21 14:46	LEE	TAL CAN

Client Sample ID: DUP-08
Lab Sample ID: 240-144436-2
Date Collected: 02/10/21 00:00
Matrix: Water
Date Received: 02/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473553	02/18/21 15:08	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	473381	02/17/21 12:30	SAM	TAL CAN

Client Sample ID: MW-80SR_021021
Lab Sample ID: 240-144436-3
Date Collected: 02/10/21 10:45
Matrix: Water
Date Received: 02/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473553	02/18/21 15:30	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	473381	02/17/21 12:55	SAM	TAL CAN

Client Sample ID: MW-137S_021021
Lab Sample ID: 240-144436-4
Date Collected: 02/10/21 12:00
Matrix: Water
Date Received: 02/12/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473553	02/18/21 15:52	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	473381	02/17/21 13:21	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144436-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

MICHIGAN 190 — TestAmerica — THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Emma Witherspoon	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day — 10 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 TRIP BLANK
DUP-08	2/10/21	—		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-80SR_021021	2/10/21	1045		6						6					N	G	X	V	X	X	X	X	X	
MW-137S_021021	2/10/21	1200		6						6					N	G	X	X	X	X	X	X	X	

240-144436 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: Elyntha Spoon	Arcadis	2/10/21 / 1700	Received by: NOVI gold Storage	Arcadis	2/10/21 / 1700
Relinquished by:	ARCADIS	2/11/21 / 0953	Received by:	ETA	2/11/21 / 0953
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company: ETA	Date/Time: 2-12-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 144436**
Canton Facility

Client Arcadis Site Name

Cooler Received on 2-12-21 Opened on 2-12-21 800

Cooler unpacked by: Ryan C

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☑ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 0.3 °C Corrected Cooler Temp. 0.4 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 3 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No FAC 2-12-21
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 59072 (Yes) No
17. Was a LL Hg or Me Hg trip blank present? Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container.
Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.
Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

DATA VERIFICATION REPORT



February 24, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144436-1
Sample date: 2021-02-10
Report received by CADENA: 2021-02-24
Initial Data Verification completed by CADENA: 2021-02-24
Number of Samples:4
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 473553 LCS recoveries were outliers biased high for the following analyte: 1,1-DICHLOROETHENE. Associated client sample results were non-detect so qualification was not required based on this high bias QC outlier.

GCMS VOC QC batch MS/MSD recovery outliers were not determined using a client sample so qualification was not required based on these sample-specific QC outliers.

GCMS VOC QC batch CCV response outliers as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144436-1

		Sample Name:	TRIP BLANK				DUP-08				MW-80SR_021021				MW-137S_021021			
		Lab Sample ID:	2401444361				2401444362				2401444363				2401444364			
		Sample Date:	2/10/2021				2/10/2021				2/10/2021				2/10/2021			
	Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC																		
	OSW-8260B																	
	1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Vinyl chloride	75-01-4	ND	1.0	ug/l	---	1.8	1.0	ug/l	---	1.6	1.0	ug/l	---	0.33	1.0	ug/l	J
	OSW-8260BBSim																	
	1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

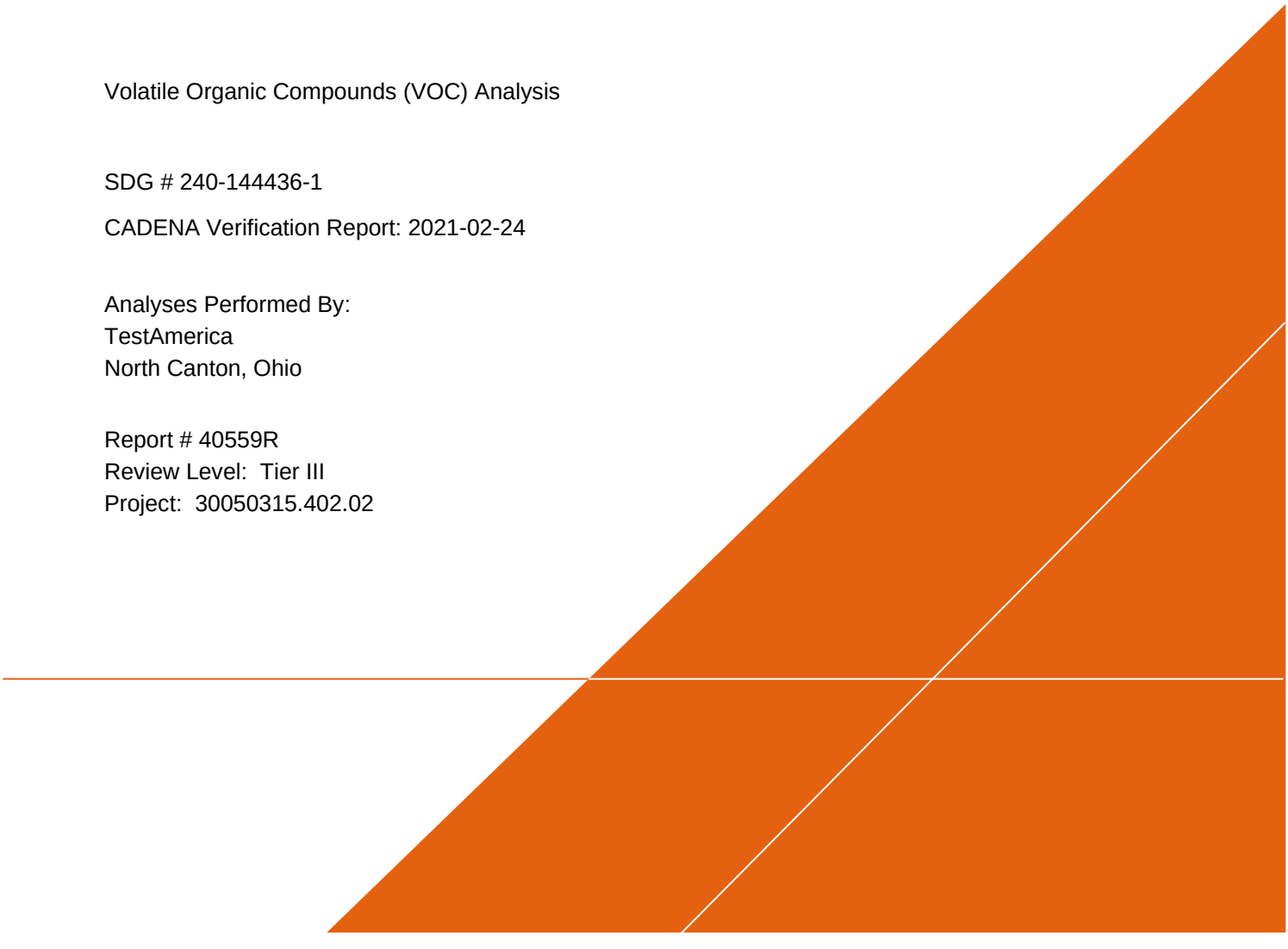
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144436-1

CADENA Verification Report: 2021-02-24

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40559R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144436-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144436-1	Water	02/10/2021		X	
DUP-08	240-144436-2	Water	02/10/2021	MW-80SR_021021	X	X
MW-80SR_021021	240-144436-3	Water	02/10/2021		X	X
MW-137S_021021	240-144436-4	Water	02/10/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial/Continuing	Compound	Criteria
TRIP BLANK DUP-08 MW-80SR_021021 MW-137S_021021	CCV %D	1,1-Dichloroethene	+47.8%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J

Initial/Continuing	Criteria	Sample Result	Qualification
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1] RRF of 0.01 only applies to compounds which are typically poor responding compounds (i.e., ketones, 1,4-dioxane, etc.)

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result (µg/L)	Duplicate Result (µg/L)	RPD
MW-80SR_021021 / DUP-08	Vinyl chloride	1.6	1.8	AC

Notes:

AC – Acceptable

The calculated differences between the parent sample and field duplicate were acceptable.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

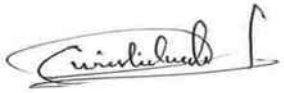
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 17, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190 — TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client: Lab sampling: Job/SDG No:
Phone: 248-994-2240	Method of Shipment/Carrier:			
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 TRIP BLANK
DUP-08	2/10/21	—		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-80SR_021021	2/10/21	1045		6						6					N	G	X	X	X	X	X	X	X	
MW-137S_021021	2/10/21	1200		6						6					N	G	X	X	X	X	X	X	X	

240-144436 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: Emma Witherspoon	Arcadis	2/10/21 1700	Received by: NOVI gold Storage	Arcadis	2/10/21 1700
Relinquished by: [signature]	ARCADIS	2/11/21 0953	Received by: [signature]	ETA	2/11/21 0953
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: [signature]	Company: ETA	Date/Time: 2-12-21 800

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02/24/2021

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144436-1

Date Collected: 02/10/21 00:00
Matrix: Water
Date Received: 02/12/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/18/21 14:46	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/18/21 14:46	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/18/21 14:46	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 14:46	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/18/21 14:46	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/18/21 14:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*123*		*75 - 130*		*02/18/21 14:46*	*1*
4-Bromofluorobenzene (Surr)	*84*		*47 - 134*		*02/18/21 14:46*	*1*
Toluene-d8 (Surr)	*88*		*69 - 122*		*02/18/21 14:46*	*1*
Dibromofluoromethane (Surr)	*111*		*78 - 129*		*02/18/21 14:46*	*1*

Client Sample ID: DUP-08

Lab Sample ID: 240-144436-2

Date Collected: 02/10/21 00:00
Matrix: Water
Date Received: 02/12/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/17/21 12:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/17/21 12:30*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/18/21 15:08	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/18/21 15:08	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/18/21 15:08	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 15:08	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/18/21 15:08	1
Vinyl chloride	**1.8**		1.0	0.20	ug/L			02/18/21 15:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*125*		*75 - 130*		*02/18/21 15:08*	*1*
4-Bromofluorobenzene (Surr)	*80*		*47 - 134*		*02/18/21 15:08*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*02/18/21 15:08*	*1*
Dibromofluoromethane (Surr)	*109*		*78 - 129*		*02/18/21 15:08*	*1*

Client Sample ID: MW-80SR_021021

Lab Sample ID: 240-144436-3

Date Collected: 02/10/21 10:45
Matrix: Water
Date Received: 02/12/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/17/21 12:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/17/21 12:55*	*1*

Client Sample ID: MW-80SR_021021
Lab Sample ID: 240-144436-3
Date Collected: 02/10/21 10:45
Matrix: Water
Date Received: 02/12/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/18/21 15:30	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/18/21 15:30	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/18/21 15:30	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 15:30	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/18/21 15:30	1
Vinyl chloride	**1.6**		1.0	0.20	ug/L			02/18/21 15:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*123*		*75 - 130*		*02/18/21 15:30*	*1*
4-Bromofluorobenzene (Surr)	*79*		*47 - 134*		*02/18/21 15:30*	*1*
Toluene-d8 (Surr)	*88*		*69 - 122*		*02/18/21 15:30*	*1*
Dibromofluoromethane (Surr)	*106*		*78 - 129*		*02/18/21 15:30*	*1*

Client Sample ID: MW-137S_021021
Lab Sample ID: 240-144436-4
Date Collected: 02/10/21 12:00
Matrix: Water
Date Received: 02/12/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/17/21 13:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/17/21 13:21*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U *+	1.0	0.19	ug/L			02/18/21 15:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/18/21 15:52	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/18/21 15:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/18/21 15:52	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/18/21 15:52	1
Vinyl chloride	**0.33**	**J**	1.0	0.20	ug/L			02/18/21 15:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*121*		*75 - 130*		*02/18/21 15:52*	*1*
4-Bromofluorobenzene (Surr)	*80*		*47 - 134*		*02/18/21 15:52*	*1*
Toluene-d8 (Surr)	*87*		*69 - 122*		*02/18/21 15:52*	*1*
Dibromofluoromethane (Surr)	*108*		*78 - 129*		*02/18/21 15:52*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144666-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/5/2021 2:30:14 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
Review your project results through TotalAccess
Have a Question? Ask The Expert
Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144666-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144666-1

Job ID: 240-144666-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144666-1

Comments
No additional comments.

Receipt
The samples were received on 2/19/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.4º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144666-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144666-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144666-1	TRIP BLANK	Water	02/17/21 00:00	02/19/21 08:00	
240-144666-2	MW-81S_021721	Water	02/17/21 09:38	02/19/21 08:00	
240-144666-3	MW-81_021721	Water	02/17/21 11:15	02/19/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144666-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144666-1

No Detections.

Client Sample ID: MW-81S_021721 — Lab Sample ID: 240-144666-2

No Detections.

Client Sample ID: MW-81_021721 — Lab Sample ID: 240-144666-3

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144666-1

Client Sample ID: TRIP BLANK

Date Collected: 02/17/21 00:00
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144666-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 19:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 19:22	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 19:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 19:22	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 19:22	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 19:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*75 - 130*		*02/25/21 19:22*	*1*
4-Bromofluorobenzene (Surr)	*67*		*47 - 134*		*02/25/21 19:22*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*02/25/21 19:22*	*1*
Dibromofluoromethane (Surr)	*114*		*78 - 129*		*02/25/21 19:22*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144666-1

Client Sample ID: MW-81S_021721
Date Collected: 02/17/21 09:38
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144666-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 20:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/25/21 20:17*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 22:56	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 22:56	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 22:56	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 22:56	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 22:56	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 22:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*114*		*75 - 130*		*02/25/21 22:56*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*02/25/21 22:56*	*1*
Toluene-d8 (Surr)	*81*		*69 - 122*		*02/25/21 22:56*	*1*
Dibromofluoromethane (Surr)	*112*		*78 - 129*		*02/25/21 22:56*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144666-1

Client Sample ID: MW-81_021721
Date Collected: 02/17/21 11:15
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144666-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 20:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/25/21 20:42*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 23:20	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 23:20	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 23:20	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 23:20	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 23:20	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 23:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*114*		*75 - 130*		*02/25/21 23:20*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*02/25/21 23:20*	*1*
Toluene-d8 (Surr)	*83*		*69 - 122*		*02/25/21 23:20*	*1*
Dibromofluoromethane (Surr)	*111*		*78 - 129*		*02/25/21 23:20*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144666-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144666-1	TRIP BLANK	108	67	80	114
240-144666-2	MW-81S_021721	114	65	81	112
240-144666-3	MW-81_021721	114	65	83	111
240-144711-E-2 MS	Matrix Spike	93	88	91	94
240-144711-F-2 MSD	Matrix Spike Duplicate	91	92	91	92
LCS 240-474507/4	Lab Control Sample	88	88	88	91
MB 240-474507/7	Method Blank	102	68	80	101

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144568-J-3 MS	Matrix Spike	79
240-144568-J-3 MSD	Matrix Spike Duplicate	83
240-144666-2	MW-81S_021721	81
240-144666-3	MW-81_021721	81
LCS 240-474490/4	Lab Control Sample	79
MB 240-474490/5	Method Blank	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474507/7
Matrix: Water
Analysis Batch: 474507

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 17:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 17:22	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 17:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 17:22	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 17:22	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 17:22	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*75 - 130*		*02/25/21 17:22*	*1*
4-Bromofluorobenzene (Surr)	*68*		*47 - 134*		*02/25/21 17:22*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*02/25/21 17:22*	*1*
Dibromofluoromethane (Surr)	*101*		*78 - 129*		*02/25/21 17:22*	*1*

Lab Sample ID: LCS 240-474507/4
Matrix: Water
Analysis Batch: 474507

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.27		ug/L		93	73 - 129
cis-1,2-Dichloroethene	10.0	9.22		ug/L		92	75 - 124
Tetrachloroethene	10.0	11.5		ug/L		115	70 - 125
trans-1,2-Dichloroethene	10.0	9.77		ug/L		98	74 - 130
Trichloroethene	10.0	9.71		ug/L		97	71 - 121
Vinyl chloride	10.0	8.03		ug/L		80	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 130*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*
Toluene-d8 (Surr)	*88*		*69 - 122*
Dibromofluoromethane (Surr)	*91*		*78 - 129*

Lab Sample ID: 240-144711-E-2 MS
Matrix: Water
Analysis Batch: 474507

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	8.83		ug/L		88	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	8.92		ug/L		89	68 - 121
Tetrachloroethene	1.0	U	10.0	11.2		ug/L		112	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.58		ug/L		96	69 - 126
Trichloroethene	1.0	U	10.0	9.00		ug/L		90	56 - 124
Vinyl chloride	1.0	U	10.0	8.39		ug/L		84	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*88*		*47 - 134*
Toluene-d8 (Surr)	*91*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144711-E-2 MS
Matrix: Water
Analysis Batch: 474507

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*94*		*78 - 129*

Lab Sample ID: 240-144711-F-2 MSD
Matrix: Water
Analysis Batch: 474507

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.03		ug/L		90	64 - 132	2	35
cis-1,2-Dichloroethene	1.0	U	10.0	9.44		ug/L		94	68 - 121	6	35
Tetrachloroethene	1.0	U	10.0	11.3		ug/L		113	52 - 129	1	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.55		ug/L		96	69 - 126	0	35
Trichloroethene	1.0	U	10.0	9.26		ug/L		93	56 - 124	3	35
Vinyl chloride	1.0	U	10.0	8.55		ug/L		86	49 - 136	2	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*91*		*75 - 130*
4-Bromofluorobenzene (Surr)	*92*		*47 - 134*
Toluene-d8 (Surr)	*91*		*69 - 122*
Dibromofluoromethane (Surr)	*92*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474490/5
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 12:43	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/25/21 12:43*	*1*

Lab Sample ID: LCS 240-474490/4
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.7		ug/L		107	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*

Lab Sample ID: 240-144568-J-3 MS
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	10.2		ug/L		102	46 - 170		

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*

Lab Sample ID: 240-144568-J-3 MSD
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.2		ug/L		102	46 - 170	0	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144666-1

GC/MS VOA

Analysis Batch: 474490

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144666-2	MW-81S_021721	Total/NA	Water	8260B SIM	
240-144666-3	MW-81_021721	Total/NA	Water	8260B SIM	
MB 240-474490/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474490/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144568-J-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144568-J-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474507

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144666-1	TRIP BLANK	Total/NA	Water	8260B	
240-144666-2	MW-81S_021721	Total/NA	Water	8260B	
240-144666-3	MW-81_021721	Total/NA	Water	8260B	
MB 240-474507/7	Method Blank	Total/NA	Water	8260B	
LCS 240-474507/4	Lab Control Sample	Total/NA	Water	8260B	
240-144711-E-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144711-F-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144666-1

Client Sample ID: TRIP BLANK
Date Collected: 02/17/21 00:00
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144666-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474507	02/25/21 19:22	LRW	TAL CAN

Client Sample ID: MW-81S_021721
Date Collected: 02/17/21 09:38
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144666-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474507	02/25/21 22:56	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474490	02/25/21 20:17	SAM	TAL CAN

Client Sample ID: MW-81_021721
Date Collected: 02/17/21 11:15
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144666-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474507	02/25/21 23:20	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474490	02/25/21 20:42	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144666-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

MICHIGAN TestAmerica 190
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Allyson Clark	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling:
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 TRIP blank
MW-01S_021721	2/17/21	9:38		6						6					N	G	X	X	X	/	/	/	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-01_021721	2/17/21	11:15		6						6					N	G	X	X	X	X	X	X	X	" "

240-144666 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	2/17/21 13:30	Novi cold storage	Arcadis	2/17/21 13:30
[signature]	Arcadis	2/18/2021	[signature]	ETA	2/18/21 10:18
[signature]	ETA	2/18/21 1138	Received in Laboratory by: [signature]	Company: TA	Date/Time: 2-19-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 446616

Client Arcadis Site Name

Cooler Received on 2-19-21 Opened on 2-19-21

Cooler unpacked by:

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.3 °C Corrected Cooler Temp. 1.4 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
   -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? Yes No
11. Sufficient quantity received to perform indicated analyses? Yes No
12. Are these work share samples and all listed on the COC? Yes No
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC907861
14. Were VOAs on the COC? Yes No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # Yes No
17. Was a LL Hg or Me Hg trip blank present? Yes No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container.
Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.
Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

DATA VERIFICATION REPORT

March 05, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144666-1
Sample date: 2021-02-17
Report received by CADENA: 2021-03-05
Initial Data Verification completed by CADENA: 2021-03-05
Number of Samples:3
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144666-1

		Sample Name:	TRIP BLANK				MW-81S_021721				MW-81_021721			
		Lab Sample ID:	2401446661				2401446662				2401446663			
		Sample Date:	2/17/2021				2/17/2021				2/17/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC													
OSW-8260B													
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim													
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

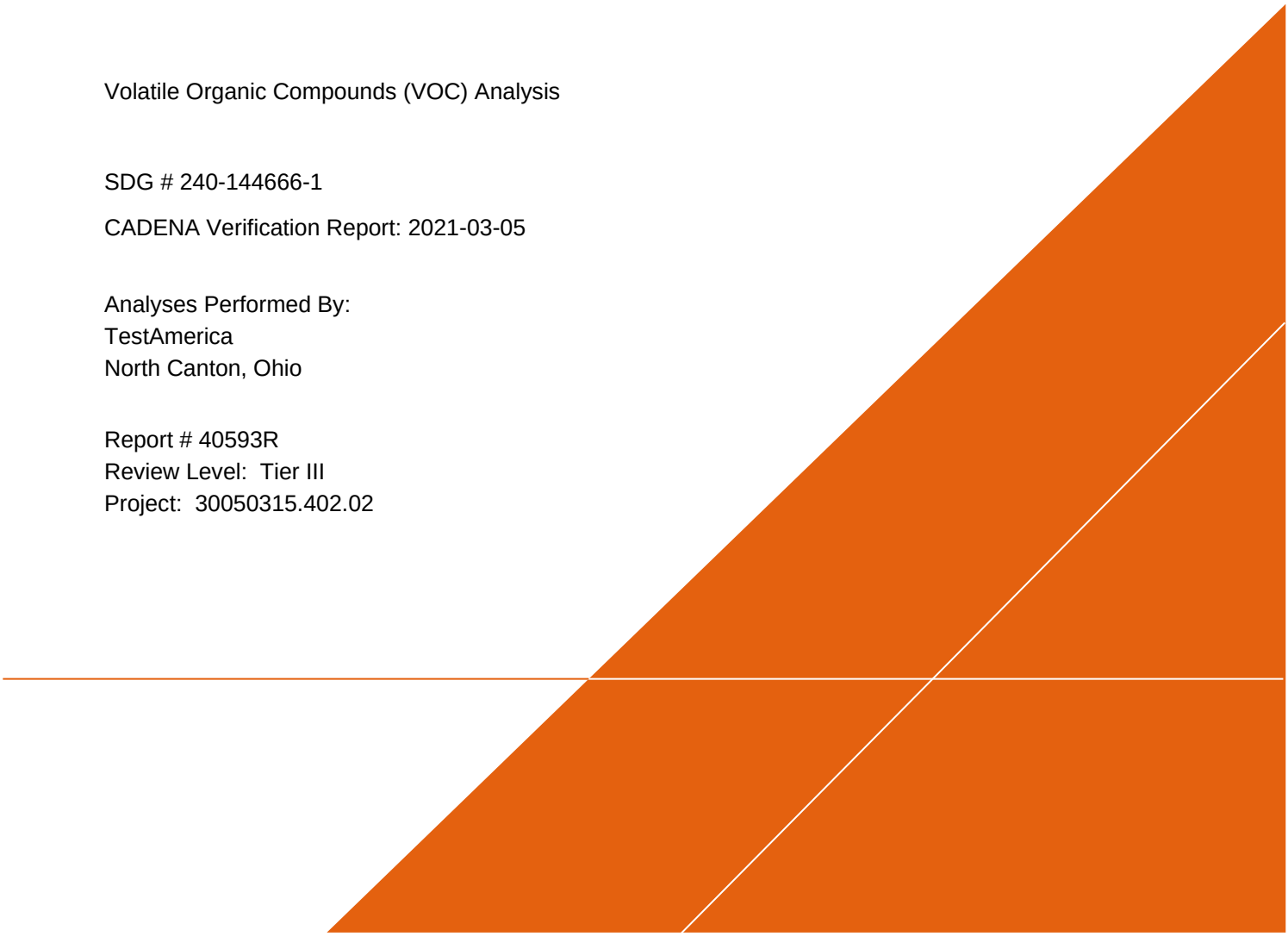
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144666-1

CADENA Verification Report: 2021-03-05

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40593R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144666-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144666-1	Water	02/17/2021		X	
MW-81S_021721	240-144666-2	Water	02/17/2021		X	X
MW-81_021721	240-144666-3	Water	02/17/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

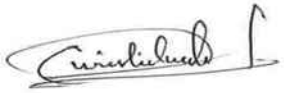
%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 17, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 18, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190 TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Allyson Hartz		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

COC No:

1 of 1 COCs

For lab use only
Walk-in client
Lab sampling
Job/SDG No:

Analysis Turnaround Time
TAT if different from below
10 day
☐ 3 weeks
☑ 2 weeks
☐ 1 week
☐ 2 days
☐ 1 day

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM					Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X					1 trip blank
MW-81S_021721	2/17/21	9:38		6						6					N	G	X	X	X	X	X	X	X					3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-81_021721	2/17/21	11 15		6						6					N	G	X	X	X	X	X	X	X					" "

240-144666 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	2/17/21 13:30	Novi cold storage	Arcadis	2/17/21 13:30
[signature]	Arcadis	2/18/2021	[signature]	ETA	2/18/21 10:18
[signature]	ETA	2/18/21 11:38	Received in Laboratory by: [signature]	TA	2-19-21 800

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03/05/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144666-1
Date Collected: 02/17/21 00:00
Matrix: Water
Date Received: 02/19/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 19:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 19:22	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 19:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 19:22	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 19:22	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 19:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*75 - 130*		*02/25/21 19:22*	*1*
4-Bromofluorobenzene (Surr)	*67*		*47 - 134*		*02/25/21 19:22*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*02/25/21 19:22*	*1*
Dibromofluoromethane (Surr)	*114*		*78 - 129*		*02/25/21 19:22*	*1*

Client Sample ID: MW-81S_021721
Lab Sample ID: 240-144666-2
Date Collected: 02/17/21 09:38
Matrix: Water
Date Received: 02/19/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 20:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/25/21 20:17*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 22:56	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 22:56	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 22:56	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 22:56	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 22:56	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 22:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*114*		*75 - 130*		*02/25/21 22:56*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*02/25/21 22:56*	*1*
Toluene-d8 (Surr)	*81*		*69 - 122*		*02/25/21 22:56*	*1*
Dibromofluoromethane (Surr)	*112*		*78 - 129*		*02/25/21 22:56*	*1*

Client Sample ID: MW-81_021721
Lab Sample ID: 240-144666-3
Date Collected: 02/17/21 11:15
Matrix: Water
Date Received: 02/19/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 20:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/25/21 20:42*	*1*

Client Sample ID: MW-81_021721
Lab Sample ID: 240-144666-3

Date Collected: 02/17/21 11:15
Matrix: Water

Date Received: 02/19/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 23:20	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 23:20	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 23:20	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 23:20	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 23:20	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 23:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*114*		*75 - 130*		*02/25/21 23:20*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*02/25/21 23:20*	*1*
Toluene-d8 (Surr)	*83*		*69 - 122*		*02/25/21 23:20*	*1*
Dibromofluoromethane (Surr)	*111*		*78 - 129*		*02/25/21 23:20*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144708-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/8/2021 11:00:10 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
Review your project results through TotalAccess
Have a Question? Ask The Expert
Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144708-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144708-1

Job ID: 240-144708-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144708-1

Comments
No additional comments.

Receipt
The samples were received on 2/20/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.9º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144708-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144708-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144708-1	TRIP BLANK	Water	02/18/21 00:00	02/20/21 08:00	
240-144708-2	MW-82D_021821	Water	02/18/21 10:45	02/20/21 08:00	
240-144708-3	MW-82SR_021821	Water	02/18/21 11:45	02/20/21 08:00	
240-144708-4	MW-135S_021821	Water	02/18/21 13:50	02/20/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144708-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144708-1

No Detections.

Client Sample ID: MW-82D_021821 — Lab Sample ID: 240-144708-2

No Detections.

Client Sample ID: MW-82SR_021821 — Lab Sample ID: 240-144708-3

No Detections.

Client Sample ID: MW-135S_021821 — Lab Sample ID: 240-144708-4

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144708-1

Client Sample ID: TRIP BLANK
Date Collected: 02/18/21 00:00
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144708-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 17:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 17:38	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 17:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 17:38	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 17:38	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 17:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*75 - 130*		*02/26/21 17:38*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*02/26/21 17:38*	*1*
Toluene-d8 (Surr)	*81*		*69 - 122*		*02/26/21 17:38*	*1*
Dibromofluoromethane (Surr)	*104*		*78 - 129*		*02/26/21 17:38*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144708-1

Client Sample ID: MW-82D_021821
Date Collected: 02/18/21 10:45
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144708-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 17:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/26/21 17:05*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 18:02	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 18:02	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 18:02	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 18:02	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 18:02	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 18:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*75 - 130*		*02/26/21 18:02*	*1*
4-Bromofluorobenzene (Surr)	*68*		*47 - 134*		*02/26/21 18:02*	*1*
Toluene-d8 (Surr)	*81*		*69 - 122*		*02/26/21 18:02*	*1*
Dibromofluoromethane (Surr)	*107*		*78 - 129*		*02/26/21 18:02*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144708-1

Client Sample ID: MW-82SR_021821
Date Collected: 02/18/21 11:45
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144708-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 17:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/26/21 17:31*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 18:26	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 18:26	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 18:26	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 18:26	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 18:26	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 18:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*75 - 130*		*02/26/21 18:26*	*1*
4-Bromofluorobenzene (Surr)	*66*		*47 - 134*		*02/26/21 18:26*	*1*
Toluene-d8 (Surr)	*81*		*69 - 122*		*02/26/21 18:26*	*1*
Dibromofluoromethane (Surr)	*109*		*78 - 129*		*02/26/21 18:26*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144708-1

Client Sample ID: MW-135S_021821
Date Collected: 02/18/21 13:50
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144708-4
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 17:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/26/21 17:56*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 18:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 18:50	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 18:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 18:50	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 18:50	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 18:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*75 - 130*		*02/26/21 18:50*	*1*
4-Bromofluorobenzene (Surr)	*62*		*47 - 134*		*02/26/21 18:50*	*1*
Toluene-d8 (Surr)	*77*		*69 - 122*		*02/26/21 18:50*	*1*
Dibromofluoromethane (Surr)	*111*		*78 - 129*		*02/26/21 18:50*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144708-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144708-1	TRIP BLANK	103	65	81	104
240-144708-2	MW-82D_021821	105	68	81	107
240-144708-3	MW-82SR_021821	112	66	81	109
240-144708-4	MW-135S_021821	110	62	77	111
240-144710-E-5 MS	Matrix Spike	94	91	94	96
240-144710-F-5 MSD	Matrix Spike Duplicate	93	89	87	89
LCS 240-474676/4	Lab Control Sample	87	93	92	89
MB 240-474676/7	Method Blank	104	68	83	102

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144708-2	MW-82D_021821	80
240-144708-3	MW-82SR_021821	81
240-144708-4	MW-135S_021821	80
240-144712-L-3 MS	Matrix Spike	80
240-144712-L-3 MSD	Matrix Spike Duplicate	81
LCS 240-474632/4	Lab Control Sample	80
MB 240-474632/5	Method Blank	80

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474676/7
Matrix: Water
Analysis Batch: 474676

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 15:39	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 15:39	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 15:39	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 15:39	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 15:39	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 15:39	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*02/26/21 15:39*	*1*
4-Bromofluorobenzene (Surr)	*68*		*47 - 134*		*02/26/21 15:39*	*1*
Toluene-d8 (Surr)	*83*		*69 - 122*		*02/26/21 15:39*	*1*
Dibromofluoromethane (Surr)	*102*		*78 - 129*		*02/26/21 15:39*	*1*

Lab Sample ID: LCS 240-474676/4
Matrix: Water
Analysis Batch: 474676

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.57		ug/L		96	73 - 129
cis-1,2-Dichloroethene	10.0	9.15		ug/L		91	75 - 124
Tetrachloroethene	10.0	12.0		ug/L		120	70 - 125
trans-1,2-Dichloroethene	10.0	10.1		ug/L		101	74 - 130
Trichloroethene	10.0	9.71		ug/L		97	71 - 121
Vinyl chloride	10.0	8.29		ug/L		83	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 130*
4-Bromofluorobenzene (Surr)	*93*		*47 - 134*
Toluene-d8 (Surr)	*92*		*69 - 122*
Dibromofluoromethane (Surr)	*89*		*78 - 129*

Lab Sample ID: 240-144710-E-5 MS
Matrix: Water
Analysis Batch: 474676

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	8.98		ug/L		90	64 - 132
cis-1,2-Dichloroethene	4.2		10.0	13.3		ug/L		91	68 - 121
Tetrachloroethene	1.0	U	10.0	10.6		ug/L		106	52 - 129
trans-1,2-Dichloroethene	0.64	J	10.0	10.4		ug/L		98	69 - 126
Trichloroethene	1.0	U	10.0	9.13		ug/L		91	56 - 124
Vinyl chloride	14		10.0	20.4		ug/L		69	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*94*		*75 - 130*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*
Toluene-d8 (Surr)	*94*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144710-E-5 MS
Matrix: Water
Analysis Batch: 474676

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	96		78 - 129

Lab Sample ID: 240-144710-F-5 MSD
Matrix: Water
Analysis Batch: 474676

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.48		ug/L		95	64 - 132	5	35
cis-1,2-Dichloroethene	4.2		10.0	12.9		ug/L		87	68 - 121	3	35
Tetrachloroethene	1.0	U	10.0	10.9		ug/L		109	52 - 129	2	35
trans-1,2-Dichloroethene	0.64	J	10.0	10.3		ug/L		96	69 - 126	1	35
Trichloroethene	1.0	U	10.0	9.48		ug/L		95	56 - 124	4	35
Vinyl chloride	14		10.0	20.5		ug/L		70	49 - 136	1	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	93		75 - 130
4-Bromofluorobenzene (Surr)	89		47 - 134
Toluene-d8 (Surr)	87		69 - 122
Dibromofluoromethane (Surr)	89		78 - 129

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474632/5
Matrix: Water
Analysis Batch: 474632

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 10:47	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	80		70 - 133		02/26/21 10:47	1

Lab Sample ID: LCS 240-474632/4
Matrix: Water
Analysis Batch: 474632

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.5		ug/L		105	80 - 135

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	80		70 - 133

Lab Sample ID: 240-144712-L-3 MS
Matrix: Water
Analysis Batch: 474632

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	10.2		ug/L		102	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*

Lab Sample ID: 240-144712-L-3 MSD
Matrix: Water
Analysis Batch: 474632

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.2		ug/L		102	46 - 170	0	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144708-1

GC/MS VOA

Analysis Batch: 474632

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144708-2	MW-82D_021821	Total/NA	Water	8260B SIM	
240-144708-3	MW-82SR_021821	Total/NA	Water	8260B SIM	
240-144708-4	MW-135S_021821	Total/NA	Water	8260B SIM	
MB 240-474632/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474632/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144712-L-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144712-L-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474676

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144708-1	TRIP BLANK	Total/NA	Water	8260B	
240-144708-2	MW-82D_021821	Total/NA	Water	8260B	
240-144708-3	MW-82SR_021821	Total/NA	Water	8260B	
240-144708-4	MW-135S_021821	Total/NA	Water	8260B	
MB 240-474676/7	Method Blank	Total/NA	Water	8260B	
LCS 240-474676/4	Lab Control Sample	Total/NA	Water	8260B	
240-144710-E-5 MS	Matrix Spike	Total/NA	Water	8260B	
240-144710-F-5 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144708-1

Client Sample ID: TRIP BLANK
Date Collected: 02/18/21 00:00
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144708-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474676	02/26/21 17:38	LRW	TAL CAN

Client Sample ID: MW-82D_021821
Date Collected: 02/18/21 10:45
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144708-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474676	02/26/21 18:02	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474632	02/26/21 17:05	SAM	TAL CAN

Client Sample ID: MW-82SR_021821
Date Collected: 02/18/21 11:45
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144708-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474676	02/26/21 18:26	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474632	02/26/21 17:31	SAM	TAL CAN

Client Sample ID: MW-135S_021821
Date Collected: 02/18/21 13:50
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144708-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474676	02/26/21 18:50	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474632	02/26/21 17:56	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144708-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

MICHIGAN 190 TestAmerica — THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton -- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	/ of / COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Allyson Hartz	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day — 10 day		Walk-in client: Lab sampling:
Phone: 248-994-2240	Method of Shipment/Carrier:			Job/SDG No:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 trip blank
MW-82D_021821	2/18/21	10:45		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-82SR_021821	2/18/21	11:45		6						6					N	G	X	X	X	X	X	X	X	
MW-135S_021821	2/18/21	13:50		6						6					N	G	X	X	X	X	X	X	X	

240-144708 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Allyson Hartz	Arcadis	2/18/21 16:00	Novi cold storage	Arcadis	2/18/21 16:00
Kristoffer Hinskey	Arcadis	2/19/21 10:11	Amanda Bathushell	ETA	2/19/21 10:11
Amanda Bathushell	ETA	2/19/21 14:33	Received in Laboratory by:	TA	2-20-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 144708
Canton Facility

Client Arcadis Site Name

Cooler unpacked by:

Cooler Received on 2-20-21 Opened on 2-20-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 0.8 °C Corrected Cooler Temp. 0.9 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC907861
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #	Yes	No
17. Was a LL Hg or Me Hg trip blank present?	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container.
Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.
Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

DATA VERIFICATION REPORT

March 08, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144708-1
Sample date: 2021-02-18
Report received by CADENA: 2021-03-08
Initial Data Verification completed by CADENA: 2021-03-08
Number of Samples:4
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144708-1

		Sample Name:	TRIP BLANK				MW-82D_021821				MW-82SR_021821				MW-135S_021821			
		Lab Sample ID:	2401447081				2401447082				2401447083				2401447084			
		Sample Date:	2/18/2021				2/18/2021				2/18/2021				2/18/2021			
	Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC																		
	OSW-8260B																	
	1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	OSW-8260BBSim																	
	1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

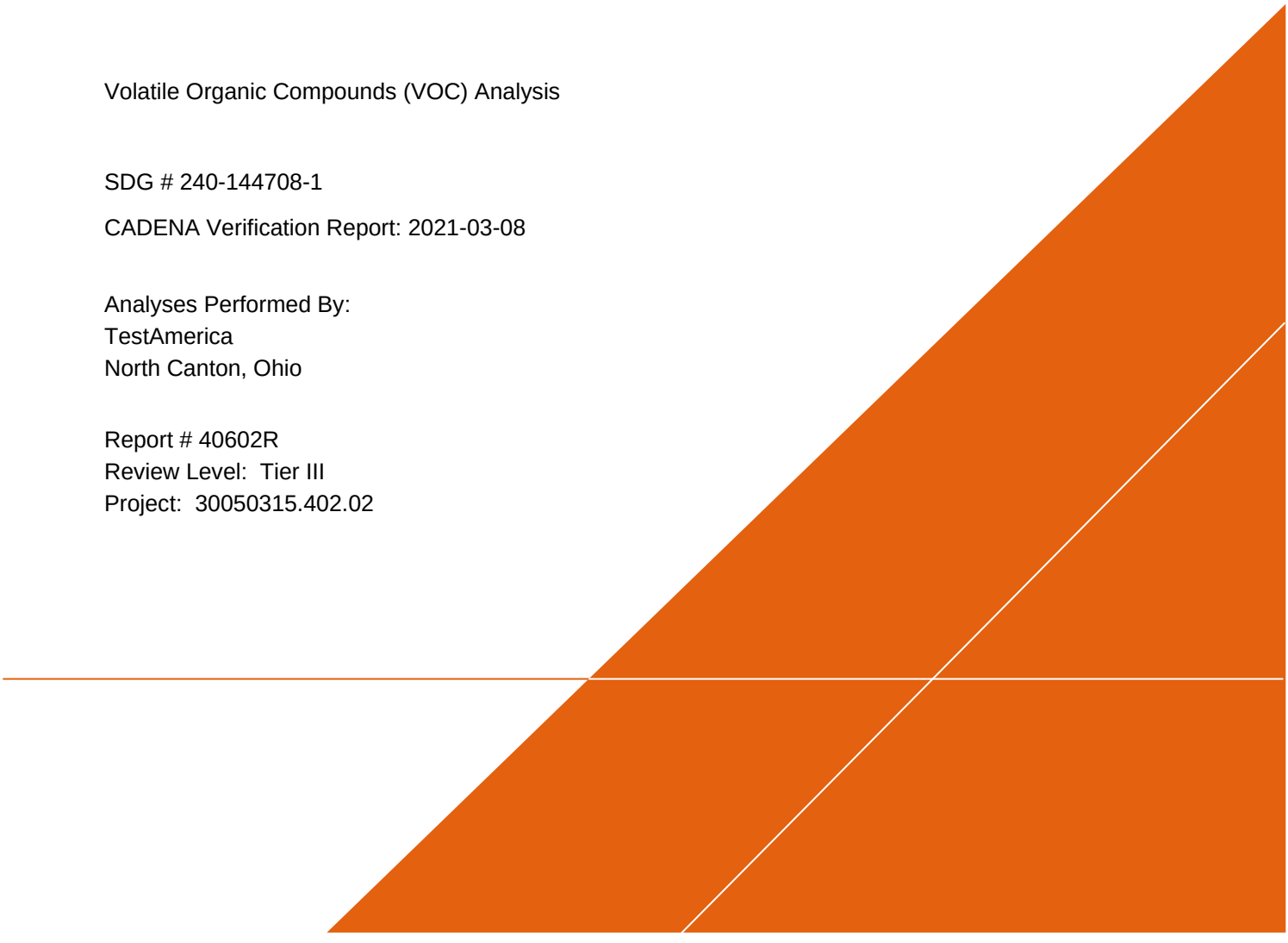
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144708-1

CADENA Verification Report: 2021-03-08

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40602R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144708-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144708-1	Water	02/18/2021		X	
MW-82D_021821	240-144708-2	Water	02/18/2021		X	X
MW-82SR_021821	240-144708-3	Water	02/18/2021		X	X
MW-135S_021821	240-144708-4	Water	02/18/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

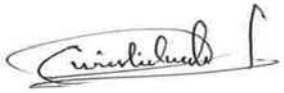
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 18, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 18, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190 TestAmerica — THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton -- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	/ of / COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Allyson Hartz	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day — 10 day		Walk-in client:
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 trip blank
MW-82D_021821	2/18/21	10:45		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-82SR_021821	2/18/21	11:45		6						6					N	G	X	X	X	X	X	X	X	↓
MW-135S_021821	2/18/21	13:50		6						6					N	G	X	X	X	X	X	X	X	

240-144708 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Allyson Hartz	Arcadis	2/18/21 16:00	NOVI cold storage	Arcadis	2/18/21 16:00
Kristoffer Hinskey	Arcadis	2/19/21 10:11	Amanda Battishell	ETA	2/19/21 10:11
Amanda Battishell	ETA	2/19/21 14:33	Received in Laboratory by:	TA	2-20-21 800

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Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144708-1

Date Collected: 02/18/21 00:00
Date Received: 02/20/21 08:00

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 17:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 17:38	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 17:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 17:38	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 17:38	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 17:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*75 - 130*		*02/26/21 17:38*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*02/26/21 17:38*	*1*
Toluene-d8 (Surr)	*81*		*69 - 122*		*02/26/21 17:38*	*1*
Dibromofluoromethane (Surr)	*104*		*78 - 129*		*02/26/21 17:38*	*1*

Client Sample ID: MW-82D_021821

Lab Sample ID: 240-144708-2

Date Collected: 02/18/21 10:45
Date Received: 02/20/21 08:00

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 17:05	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/26/21 17:05*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 18:02	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 18:02	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 18:02	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 18:02	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 18:02	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 18:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*75 - 130*		*02/26/21 18:02*	*1*
4-Bromofluorobenzene (Surr)	*68*		*47 - 134*		*02/26/21 18:02*	*1*
Toluene-d8 (Surr)	*81*		*69 - 122*		*02/26/21 18:02*	*1*
Dibromofluoromethane (Surr)	*107*		*78 - 129*		*02/26/21 18:02*	*1*

Client Sample ID: MW-82SR_021821

Lab Sample ID: 240-144708-3

Date Collected: 02/18/21 11:45
Date Received: 02/20/21 08:00

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 17:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/26/21 17:31*	*1*

Client Sample ID: MW-82SR_021821
Lab Sample ID: 240-144708-3
Date Collected: 02/18/21 11:45
Matrix: Water
Date Received: 02/20/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 18:26	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 18:26	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 18:26	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 18:26	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 18:26	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 18:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*112*		*75 - 130*		*02/26/21 18:26*	*1*
4-Bromofluorobenzene (Surr)	*66*		*47 - 134*		*02/26/21 18:26*	*1*
Toluene-d8 (Surr)	*81*		*69 - 122*		*02/26/21 18:26*	*1*
Dibromofluoromethane (Surr)	*109*		*78 - 129*		*02/26/21 18:26*	*1*

Client Sample ID: MW-135S_021821
Lab Sample ID: 240-144708-4
Date Collected: 02/18/21 13:50
Matrix: Water
Date Received: 02/20/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 17:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/26/21 17:56*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 18:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 18:50	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 18:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 18:50	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 18:50	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 18:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*75 - 130*		*02/26/21 18:50*	*1*
4-Bromofluorobenzene (Surr)	*62*		*47 - 134*		*02/26/21 18:50*	*1*
Toluene-d8 (Surr)	*77*		*69 - 122*		*02/26/21 18:50*	*1*
Dibromofluoromethane (Surr)	*111*		*78 - 129*		*02/26/21 18:50*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144807-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/10/2021 9:01:34 AM

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Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144807-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144807-1

Job ID: 240-144807-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144807-1

Comments
No additional comments.

Receipt
The samples were received on 2/24/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.3º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144807-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144807-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144807-1	TRIP BLANK	Water	02/22/21 00:00	02/24/21 08:00	
240-144807-2	MW-133S_022221	Water	02/22/21 10:35	02/24/21 08:00	
240-144807-3	MW-83_022221	Water	02/22/21 13:37	02/24/21 08:00	
240-144807-4	MW-83S_022221	Water	02/22/21 14:45	02/24/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144807-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144807-1

No Detections.

Client Sample ID: MW-133S_022221 — Lab Sample ID: 240-144807-2

No Detections.

Client Sample ID: MW-83_022221 — Lab Sample ID: 240-144807-3

No Detections.

Client Sample ID: MW-83S_022221 — Lab Sample ID: 240-144807-4

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144807-1

Client Sample ID: TRIP BLANK
Date Collected: 02/22/21 00:00
Date Received: 02/24/21 08:00

Lab Sample ID: 240-144807-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 23:48	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 23:48	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 23:48	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 23:48	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 23:48	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 23:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*75 - 130*		*03/01/21 23:48*	*1*
4-Bromofluorobenzene (Surr)	*61*		*47 - 134*		*03/01/21 23:48*	*1*
Toluene-d8 (Surr)	*86*		*69 - 122*		*03/01/21 23:48*	*1*
Dibromofluoromethane (Surr)	*112*		*78 - 129*		*03/01/21 23:48*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144807-1

Client Sample ID: MW-133S_022221
Date Collected: 02/22/21 10:35
Date Received: 02/24/21 08:00

Lab Sample ID: 240-144807-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 14:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*70 - 133*		*03/01/21 14:18*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 18:14	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 18:14	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 18:14	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 18:14	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 18:14	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 18:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*114*		*75 - 130*		*03/01/21 18:14*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*03/01/21 18:14*	*1*
Toluene-d8 (Surr)	*79*		*69 - 122*		*03/01/21 18:14*	*1*
Dibromofluoromethane (Surr)	*112*		*78 - 129*		*03/01/21 18:14*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144807-1

Client Sample ID: MW-83_022221
Date Collected: 02/22/21 13:37
Date Received: 02/24/21 08:00

Lab Sample ID: 240-144807-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 14:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 133*		*03/01/21 14:43*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 18:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 18:38	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 18:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 18:38	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 18:38	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 18:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*111*		*75 - 130*		*03/01/21 18:38*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*03/01/21 18:38*	*1*
Toluene-d8 (Surr)	*77*		*69 - 122*		*03/01/21 18:38*	*1*
Dibromofluoromethane (Surr)	*109*		*78 - 129*		*03/01/21 18:38*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144807-1

Client Sample ID: MW-83S_022221
Date Collected: 02/22/21 14:45
Date Received: 02/24/21 08:00

Lab Sample ID: 240-144807-4
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 15:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*70 - 133*		*03/01/21 15:08*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 19:02	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 19:02	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 19:02	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 19:02	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 19:02	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 19:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*114*		*75 - 130*		*03/01/21 19:02*	*1*
4-Bromofluorobenzene (Surr)	*64*		*47 - 134*		*03/01/21 19:02*	*1*
Toluene-d8 (Surr)	*78*		*69 - 122*		*03/01/21 19:02*	*1*
Dibromofluoromethane (Surr)	*112*		*78 - 129*		*03/01/21 19:02*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144807-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144807-1	TRIP BLANK	116	61	86	112
240-144807-2	MW-133S_022221	114	65	79	112
240-144807-3	MW-83_022221	111	65	77	109
240-144807-4	MW-83S_022221	114	64	78	112
240-144807-4 MS	MW-83S-MS_022221	92	91	89	96
240-144807-4 MSD	MW-83S-MSD_022221	86	91	88	90
LCS 240-474892/4	Lab Control Sample	88	89	89	89
MB 240-474892/7	Method Blank	104	70	82	110

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144807-2	MW-133S_022221	89
240-144807-3	MW-83_022221	94
240-144807-4	MW-83S_022221	85
240-144807-4 MS	MW-83S-MS_022221	90
240-144807-4 MSD	MW-83S-MSD_022221	88
LCS 240-474842/4	Lab Control Sample	90
MB 240-474842/5	Method Blank	86

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474892/7
Matrix: Water
Analysis Batch: 474892

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 15:51	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 15:51	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 15:51	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 15:51	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 15:51	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 15:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*03/01/21 15:51*	*1*
4-Bromofluorobenzene (Surr)	*70*		*47 - 134*		*03/01/21 15:51*	*1*
Toluene-d8 (Surr)	*82*		*69 - 122*		*03/01/21 15:51*	*1*
Dibromofluoromethane (Surr)	*110*		*78 - 129*		*03/01/21 15:51*	*1*

Lab Sample ID: LCS 240-474892/4
Matrix: Water
Analysis Batch: 474892

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.84		ug/L		98	73 - 129
cis-1,2-Dichloroethene	10.0	9.22		ug/L		92	75 - 124
Tetrachloroethene	10.0	10.9		ug/L		109	70 - 125
trans-1,2-Dichloroethene	10.0	9.78		ug/L		98	74 - 130
Trichloroethene	10.0	9.30		ug/L		93	71 - 121
Vinyl chloride	10.0	9.80		ug/L		98	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 130*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*
Toluene-d8 (Surr)	*89*		*69 - 122*
Dibromofluoromethane (Surr)	*89*		*78 - 129*

Lab Sample ID: 240-144807-4 MS
Matrix: Water
Analysis Batch: 474892

Client Sample ID: MW-83S-MS_022221
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.25		ug/L		93	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	9.38		ug/L		94	68 - 121
Tetrachloroethene	1.0	U	10.0	11.7		ug/L		117	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.98		ug/L		100	69 - 126
Trichloroethene	1.0	U	10.0	9.60		ug/L		96	56 - 124
Vinyl chloride	1.0	U	10.0	10.4		ug/L		104	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*
Toluene-d8 (Surr)	*89*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144807-4 MS
Matrix: Water
Analysis Batch: 474892

Client Sample ID: MW-83S-MS_022221
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	96		78 - 129

Lab Sample ID: 240-144807-4 MSD
Matrix: Water
Analysis Batch: 474892

Client Sample ID: MW-83S-MSD_022221
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.00		ug/L		90	64 - 132	3	35
cis-1,2-Dichloroethene	1.0	U	10.0	8.99		ug/L		90	68 - 121	4	35
Tetrachloroethene	1.0	U	10.0	11.0		ug/L		110	52 - 129	6	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.43		ug/L		94	69 - 126	6	35
Trichloroethene	1.0	U	10.0	9.01		ug/L		90	56 - 124	6	35
Vinyl chloride	1.0	U	10.0	10.1		ug/L		101	49 - 136	3	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	86		75 - 130
4-Bromofluorobenzene (Surr)	91		47 - 134
Toluene-d8 (Surr)	88		69 - 122
Dibromofluoromethane (Surr)	90		78 - 129

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474842/5
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 12:12	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	86		70 - 133		03/01/21 12:12	1

Lab Sample ID: LCS 240-474842/4
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.05		ug/L		91	80 - 135

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	90		70 - 133

Lab Sample ID: 240-144807-4 MS
Matrix: Water
Analysis Batch: 474842

Client Sample ID: MW-83S-MS_022221
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	8.95		ug/L		90	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*90*		*70 - 133*

Lab Sample ID: 240-144807-4 MSD
Matrix: Water
Analysis Batch: 474842

Client Sample ID: MW-83S-MSD_022221
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.28		ug/L		93	46 - 170	4	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144807-1

GC/MS VOA

Analysis Batch: 474842

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144807-2	MW-133S_022221	Total/NA	Water	8260B SIM	
240-144807-3	MW-83_022221	Total/NA	Water	8260B SIM	
240-144807-4	MW-83S_022221	Total/NA	Water	8260B SIM	
MB 240-474842/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474842/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144807-4 MS	MW-83S-MS_022221	Total/NA	Water	8260B SIM	
240-144807-4 MSD	MW-83S-MSD_022221	Total/NA	Water	8260B SIM	

Analysis Batch: 474892

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144807-1	TRIP BLANK	Total/NA	Water	8260B	
240-144807-2	MW-133S_022221	Total/NA	Water	8260B	
240-144807-3	MW-83_022221	Total/NA	Water	8260B	
240-144807-4	MW-83S_022221	Total/NA	Water	8260B	
MB 240-474892/7	Method Blank	Total/NA	Water	8260B	
LCS 240-474892/4	Lab Control Sample	Total/NA	Water	8260B	
240-144807-4 MS	MW-83S-MS_022221	Total/NA	Water	8260B	
240-144807-4 MSD	MW-83S-MSD_022221	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144807-1

Client Sample ID: TRIP BLANK
Date Collected: 02/22/21 00:00
Date Received: 02/24/21 08:00

Lab Sample ID: 240-144807-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474892	03/01/21 23:48	LRW	TAL CAN

Client Sample ID: MW-133S_022221
Date Collected: 02/22/21 10:35
Date Received: 02/24/21 08:00

Lab Sample ID: 240-144807-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474892	03/01/21 18:14	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474842	03/01/21 14:18	SAM	TAL CAN

Client Sample ID: MW-83_022221
Date Collected: 02/22/21 13:37
Date Received: 02/24/21 08:00

Lab Sample ID: 240-144807-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474892	03/01/21 18:38	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474842	03/01/21 14:43	SAM	TAL CAN

Client Sample ID: MW-83S_022221
Date Collected: 02/22/21 14:45
Date Received: 02/24/21 08:00

Lab Sample ID: 240-144807-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474892	03/01/21 19:02	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474842	03/01/21 15:08	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144807-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

1-21-3

Chain of Custody Record

MICHIGAN 190 TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Allyson Hartz	TAT if different from below: 10 day; 3 weeks / 2 weeks / 1 week / 2 days / 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 trip blank
MW-1335_022221	2/22/21	10:35		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-83_022221	2/22/21	13:37		6						6					N	G	X	X	X	X	X	X	X	
MW-835_022221	2/22/21	14:45		6						6					N	G	X	X	X	X	X	X	X	
MW-835-MS_022221	2/22/21	14:45		6						6					N	G	X	X	X	X	X	X	X	run MS/MSD
MW-835-MSD_022221	2/22/21	14:45		6						6					N	G	X	X	X	X	X	X	X	run MS/MSD

240-144807 Chain of Custody

Possible Hazard Identification: Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / Disposal By Lab / Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Allyson Hartz	Arcadis	2/22/21 17:00	Novi cold storage	Arcadis	2/22/21 17:00
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Arcadis	2/23/21	Amanda Battershell	ETA	2/23/21 10:04
Relinquished by: Amanda Battershell	Company: ETA	Date/Time: 2/23/21 10:47	Received in Laboratory by:	Company: TA	Date/Time: 2-24-21 840

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3/10/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 144807
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by:

Cooler Received on 2-24-21 Opened on 2-24-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1-2 °C Corrected Cooler Temp. 1-3 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
   -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? Yes No
11. Sufficient quantity received to perform indicated analyses? Yes No
12. Are these work share samples and all listed on the COC? Yes No
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC907861
14. Were VOAs on the COC? Yes No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this. Yes No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #_____ Yes No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

March 10, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144807-1
Sample date: 2021-02-22
Report received by CADENA: 2021-03-10
Initial Data Verification completed by CADENA: 2021-03-10
Number of Samples:4
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, MS/MSD Recovery, MS/MSD RPD, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144807-1

		Sample Name:	TRIP BLANK				MW-133S_022221				MW-83_022221				MW-83S_022221			
		Lab Sample ID:	2401448071				2401448072				2401448073				2401448074			
		Sample Date:	2/22/2021				2/22/2021				2/22/2021				2/22/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC																	
OSW-8260B																	
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim																	
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

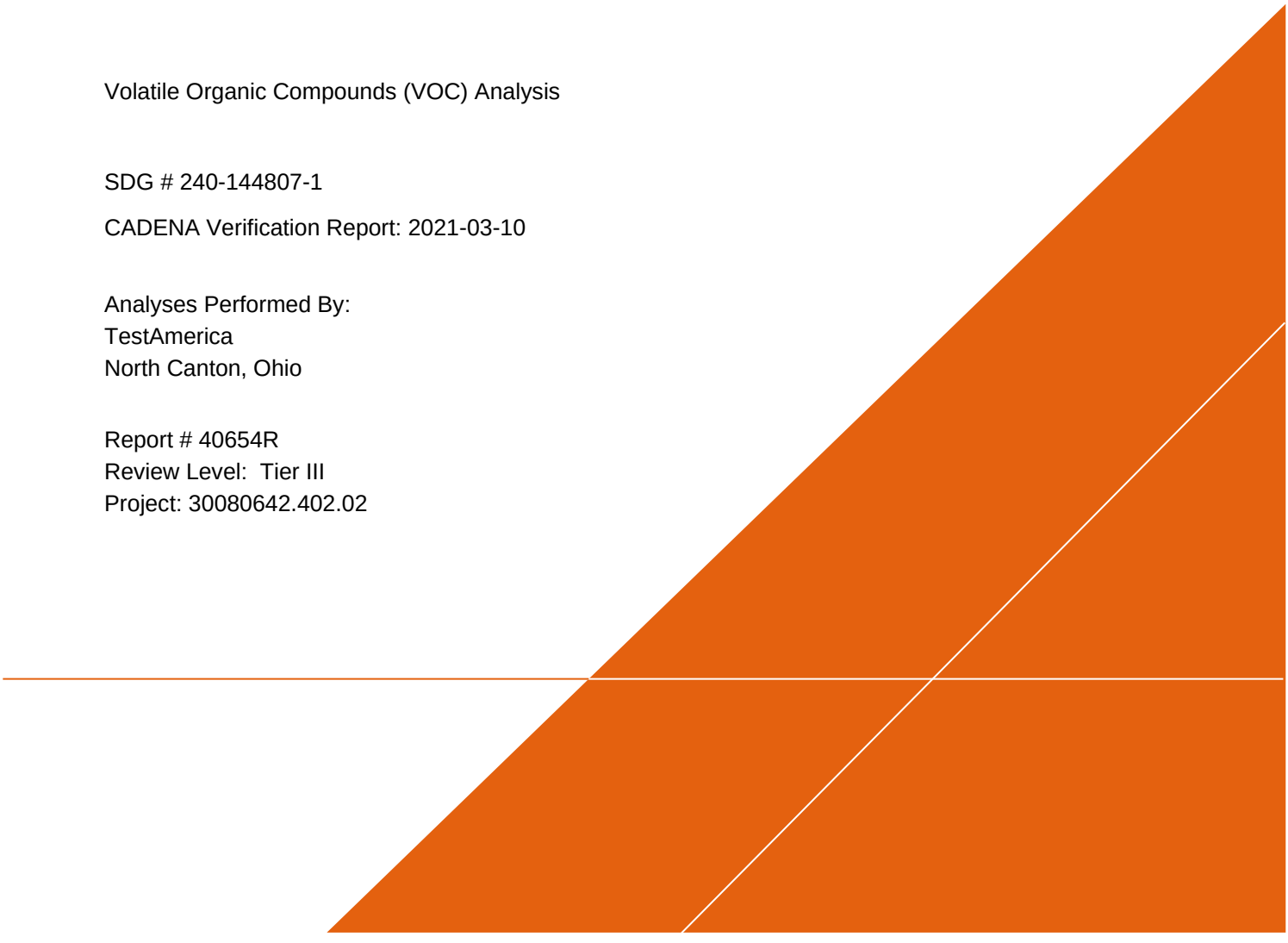
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144807-1

CADENA Verification Report: 2021-03-10

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40654R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144807-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144807-1	Water	02/22/2021		X	
MW-133S_022221	240-144807-2	Water	02/22/2021		X	X
MW-83_022221	240-144807-3	Water	02/22/2021		X	X
MW-83S_022221	240-144807-4	Water	02/22/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial/Continuing	Compound	Criteria
TRIP BLANK MW-133S_022221 MW-83_022221 MW-83S_022221	CCV %D	Tetrachloroethene	+21.9%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J

Initial/Continuing	Criteria	Sample Result	Qualification
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1] RRF of 0.01 only applies to compounds which are typically poor responding compounds (i.e., ketones, 1,4-dioxane, etc.)

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

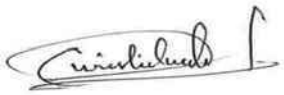
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 22, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 24, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

1-21-3

Chain of Custody Record

MICHIGAN 190

TestAmerica — THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	/ of / COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Allyson Hartz	TAT if different from below: 10 day; 3 weeks / 2 weeks / 1 week / 2 days / 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 trip blank
MW-1335_022221	2/22/21	10:35		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-83_022221	2/22/21	13:37		6						6					N	G	X	X	X	X	X	X	X	
MW-835_022221	2/22/21	14:45		6						6					N	G	X	X	X	X	X	X	X	
MW-835-MS_022221	2/22/21	14:45		6						6					N	G	X	X	X	X	X	X	X	run MS/MSD
MW-835-MSD_022221	2/22/21	14:45		6						6					N	G	X	X	X	X	X	X	X	run MS/MSD

240-144807 Chain of Custody

Possible Hazard Identification: Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / Disposal By Lab / Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Allyson Hartz	Arcadis	2/22/21 17:00	Novi cold storage	Arcadis	2/22/21 17:00
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[illegible]	Arcadis	2/23/2021	Amanda Battershell	ETA	2/23/21 10:04
Relinquished by: Amanda Battershell	Company: ETA	Date/Time: 2/23/21 10:47	Received in Laboratory by:	Company: TA	Date/Time: 2-24-21 800

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03/10/2021

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144807-1

Date Collected: 02/22/21 00:00
Matrix: Water
Date Received: 02/24/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 23:48	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 23:48	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 23:48	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 23:48	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 23:48	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 23:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*75 - 130*		*03/01/21 23:48*	*1*
4-Bromofluorobenzene (Surr)	*61*		*47 - 134*		*03/01/21 23:48*	*1*
Toluene-d8 (Surr)	*86*		*69 - 122*		*03/01/21 23:48*	*1*
Dibromofluoromethane (Surr)	*112*		*78 - 129*		*03/01/21 23:48*	*1*

Client Sample ID: MW-133S_022221

Lab Sample ID: 240-144807-2

Date Collected: 02/22/21 10:35
Matrix: Water
Date Received: 02/24/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 14:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*70 - 133*		*03/01/21 14:18*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 18:14	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 18:14	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 18:14	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 18:14	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 18:14	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 18:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*114*		*75 - 130*		*03/01/21 18:14*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*03/01/21 18:14*	*1*
Toluene-d8 (Surr)	*79*		*69 - 122*		*03/01/21 18:14*	*1*
Dibromofluoromethane (Surr)	*112*		*78 - 129*		*03/01/21 18:14*	*1*

Client Sample ID: MW-83_022221

Lab Sample ID: 240-144807-3

Date Collected: 02/22/21 13:37
Matrix: Water
Date Received: 02/24/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 14:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 133*		*03/01/21 14:43*	*1*

Client Sample ID: MW-83_022221
Lab Sample ID: 240-144807-3
Date Collected: 02/22/21 13:37
Matrix: Water
Date Received: 02/24/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 18:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 18:38	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 18:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 18:38	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 18:38	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 18:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*111*		*75 - 130*		*03/01/21 18:38*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*03/01/21 18:38*	*1*
Toluene-d8 (Surr)	*77*		*69 - 122*		*03/01/21 18:38*	*1*
Dibromofluoromethane (Surr)	*109*		*78 - 129*		*03/01/21 18:38*	*1*

Client Sample ID: MW-83S_022221
Lab Sample ID: 240-144807-4
Date Collected: 02/22/21 14:45
Matrix: Water
Date Received: 02/24/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 15:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*70 - 133*		*03/01/21 15:08*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 19:02	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 19:02	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 19:02	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 19:02	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 19:02	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 19:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*114*		*75 - 130*		*03/01/21 19:02*	*1*
4-Bromofluorobenzene (Surr)	*64*		*47 - 134*		*03/01/21 19:02*	*1*
Toluene-d8 (Surr)	*78*		*69 - 122*		*03/01/21 19:02*	*1*
Dibromofluoromethane (Surr)	*112*		*78 - 129*		*03/01/21 19:02*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144753-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/9/2021 10:00:13 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144753-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144753-1

Job ID: 240-144753-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144753-1

Comments
No additional comments.

Receipt
The samples were received on 2/23/2021 9:20 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.6º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144753-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144753-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144753-1	TRIP BLANK	Water	02/19/21 00:00	02/23/21 09:20	
240-144753-2	MW-85_021921	Water	02/19/21 13:15	02/23/21 09:20	
240-144753-3	MW-85SR_021921	Water	02/19/21 14:43	02/23/21 09:20	
240-144753-4	DUP-07	Water	02/19/21 00:00	02/23/21 09:20	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144753-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144753-1

No Detections.

Client Sample ID: MW-85_021921 — Lab Sample ID: 240-144753-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	5.8		1.0	0.20	ug/L	1		8260B	Total/NA

Client Sample ID: MW-85SR_021921 — Lab Sample ID: 240-144753-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	1.6		1.0	0.20	ug/L	1		8260B	Total/NA

Client Sample ID: DUP-07 — Lab Sample ID: 240-144753-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	5.7		1.0	0.20	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144753-1

Client Sample ID: TRIP BLANK
Date Collected: 02/19/21 00:00
Date Received: 02/23/21 09:20

Lab Sample ID: 240-144753-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 17:14	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 17:14	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 17:14	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 17:14	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 17:14	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 17:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*75 - 130*		*03/01/21 17:14*	*1*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*		*03/01/21 17:14*	*1*
Toluene-d8 (Surr)	*88*		*69 - 122*		*03/01/21 17:14*	*1*
Dibromofluoromethane (Surr)	*108*		*78 - 129*		*03/01/21 17:14*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144753-1

Client Sample ID: MW-85_021921
Date Collected: 02/19/21 13:15
Date Received: 02/23/21 09:20

Lab Sample ID: 240-144753-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 17:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*70 - 133*		*02/26/21 17:34*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 17:39	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 17:39	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 17:39	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 17:39	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 17:39	1
Vinyl chloride	**5.8**		1.0	0.20	ug/L			03/01/21 17:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*75 - 130*		*03/01/21 17:39*	*1*
4-Bromofluorobenzene (Surr)	*102*		*47 - 134*		*03/01/21 17:39*	*1*
Toluene-d8 (Surr)	*91*		*69 - 122*		*03/01/21 17:39*	*1*
Dibromofluoromethane (Surr)	*105*		*78 - 129*		*03/01/21 17:39*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144753-1

Client Sample ID: MW-85SR_021921
Date Collected: 02/19/21 14:43
Date Received: 02/23/21 09:20

Lab Sample ID: 240-144753-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 17:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 133*		*02/26/21 17:59*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 18:04	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 18:04	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 18:04	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 18:04	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 18:04	1
Vinyl chloride	**1.6**		1.0	0.20	ug/L			03/01/21 18:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*03/01/21 18:04*	*1*
4-Bromofluorobenzene (Surr)	*101*		*47 - 134*		*03/01/21 18:04*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*03/01/21 18:04*	*1*
Dibromofluoromethane (Surr)	*101*		*78 - 129*		*03/01/21 18:04*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144753-1

Client Sample ID: DUP-07
Date Collected: 02/19/21 00:00
Date Received: 02/23/21 09:20

Lab Sample ID: 240-144753-4
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 18:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*70 - 133*		*02/26/21 18:24*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 18:28	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 18:28	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 18:28	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 18:28	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 18:28	1
Vinyl chloride	**5.7**		1.0	0.20	ug/L			03/01/21 18:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*03/01/21 18:28*	*1*
4-Bromofluorobenzene (Surr)	*102*		*47 - 134*		*03/01/21 18:28*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*03/01/21 18:28*	*1*
Dibromofluoromethane (Surr)	*104*		*78 - 129*		*03/01/21 18:28*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144753-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144753-1	TRIP BLANK	103	103	88	108
240-144753-2	MW-85_021921	103	102	91	105
240-144753-3	MW-85SR_021921	101	101	90	101
240-144753-4	DUP-07	104	102	92	104
240-144754-B-2 MS	Matrix Spike	93	104	94	93
240-144754-B-2 MSD	Matrix Spike Duplicate	93	103	93	95
LCS 240-474864/5	Lab Control Sample	92	101	93	91
MB 240-474864/8	Method Blank	101	102	93	99

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144711-O-2 MS	Matrix Spike	85
240-144711-O-2 MSD	Matrix Spike Duplicate	86
240-144753-2	MW-85_021921	89
240-144753-3	MW-85SR_021921	94
240-144753-4	DUP-07	92
LCS 240-474631/4	Lab Control Sample	82
MB 240-474631/5	Method Blank	80

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474864/8
Matrix: Water
Analysis Batch: 474864

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 13:08	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 13:08	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 13:08	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 13:08	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 13:08	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 13:08	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*03/01/21 13:08*	*1*
4-Bromofluorobenzene (Surr)	*102*		*47 - 134*		*03/01/21 13:08*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*03/01/21 13:08*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*03/01/21 13:08*	*1*

Lab Sample ID: LCS 240-474864/5
Matrix: Water
Analysis Batch: 474864

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	20.0	20.5		ug/L		103	73 - 129
cis-1,2-Dichloroethene	20.0	20.9		ug/L		104	75 - 124
Tetrachloroethene	20.0	20.8		ug/L		104	70 - 125
trans-1,2-Dichloroethene	20.0	20.5		ug/L		102	74 - 130
Trichloroethene	20.0	19.8		ug/L		99	71 - 121
Vinyl chloride	20.0	23.6		ug/L		118	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*
4-Bromofluorobenzene (Surr)	*101*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*91*		*78 - 129*

Lab Sample ID: 240-144754-B-2 MS
Matrix: Water
Analysis Batch: 474864

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	500	U	10000	9650		ug/L		96	64 - 132
Tetrachloroethene	500	U	10000	9480		ug/L		95	52 - 129
trans-1,2-Dichloroethene	210	J	10000	9670		ug/L		95	69 - 126
Trichloroethene	500	U	10000	9110		ug/L		91	56 - 124
Vinyl chloride	12000		10000	22900		ug/L		111	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*104*		*47 - 134*
Toluene-d8 (Surr)	*94*		*69 - 122*
Dibromofluoromethane (Surr)	*93*		*78 - 129*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144754-B-2 MSD
Matrix: Water
Analysis Batch: 474864

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	500	U	10000	10800		ug/L		108	64 - 132	11	35
Tetrachloroethene	500	U	10000	10200		ug/L		102	52 - 129	7	35
trans-1,2-Dichloroethene	210	J	10000	10800		ug/L		106	69 - 126	11	35
Trichloroethene	500	U	10000	9990		ug/L		100	56 - 124	9	35
Vinyl chloride	12000		10000	25200		ug/L		134	49 - 136	9	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*95*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474631/5
Matrix: Water
Analysis Batch: 474631

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 10:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/26/21 10:51*	*1*

Lab Sample ID: LCS 240-474631/4
Matrix: Water
Analysis Batch: 474631

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	9.80		ug/L		98	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144711-O-2 MS
Matrix: Water
Analysis Batch: 474631

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	9.26		ug/L		93	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*70 - 133*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144711-O-2 MSD
Matrix: Water
Analysis Batch: 474631

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.91		ug/L		99	46 - 170	7	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144753-1

GC/MS VOA

Analysis Batch: 474631

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144753-2	MW-85_021921	Total/NA	Water	8260B SIM	
240-144753-3	MW-85SR_021921	Total/NA	Water	8260B SIM	
240-144753-4	DUP-07	Total/NA	Water	8260B SIM	
MB 240-474631/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474631/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144711-O-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144711-O-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474864

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144753-1	TRIP BLANK	Total/NA	Water	8260B	
240-144753-2	MW-85_021921	Total/NA	Water	8260B	
240-144753-3	MW-85SR_021921	Total/NA	Water	8260B	
240-144753-4	DUP-07	Total/NA	Water	8260B	
MB 240-474864/8	Method Blank	Total/NA	Water	8260B	
LCS 240-474864/5	Lab Control Sample	Total/NA	Water	8260B	
240-144754-B-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144754-B-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144753-1

Client Sample ID: TRIP BLANK
Date Collected: 02/19/21 00:00
Date Received: 02/23/21 09:20

Lab Sample ID: 240-144753-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474864	03/01/21 17:14	HMB	TAL CAN

Client Sample ID: MW-85_021921
Date Collected: 02/19/21 13:15
Date Received: 02/23/21 09:20

Lab Sample ID: 240-144753-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474864	03/01/21 17:39	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		1	474631	02/26/21 17:34	SAM	TAL CAN

Client Sample ID: MW-85SR_021921
Date Collected: 02/19/21 14:43
Date Received: 02/23/21 09:20

Lab Sample ID: 240-144753-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474864	03/01/21 18:04	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		1	474631	02/26/21 17:59	SAM	TAL CAN

Client Sample ID: DUP-07
Date Collected: 02/19/21 00:00
Date Received: 02/23/21 09:20

Lab Sample ID: 240-144753-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474864	03/01/21 18:28	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		1	474631	02/26/21 18:24	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144753-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

2 of 5

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190

TestAmerica Laboratories, Inc.

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Kara Donahue	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client: Lab sampling:
Phone: 248-994-2240	Method of Shipment/Carrier:			Job/SDG No:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAcl/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-85_021921	2/19/21	1315		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-85SR_021921	2/19/21	1443		6						6					N	G	X	X	X	X	X	X	X	
Dup-07	2/19/21	—		6						6					N	G	X	X	X	X	X	X	X	

240-144753 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: Kara Donahue	Arcadis	2/19/21 1633	Received by: Novi Cold Storage	Arcadis	2/19/21 1633
Relinquished by:	Arcadis	2/22/21	Received by: Amanda Battchell	ETA	2/22/21 1005
Relinquished by: Amanda Battchell	ETA	2/22/21 11:19	Received in Laboratory by:	TA	2-23-21 920

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 144753
Canton Facility

Client Arcadis Site Name

Cooler unpacked by:

Cooler Received on 2-23-21 Opened on 2-23-21

FedEx: 1st (Grd) Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2-5 °C Corrected Cooler Temp. 2-6 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	(Yes)	No
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	(No)
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present?	Yes	(No)

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container.
Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.
Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

DATA VERIFICATION REPORT

March 09, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144753-1
Sample date: 2021-02-19
Report received by CADENA: 2021-03-09
Initial Data Verification completed by CADENA: 2021-03-09
Number of Samples:4
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144753-1

		Sample Name:	TRIP BLANK				MW-85_021921				MW-85SR_021921				DUP-07			
		Lab Sample ID:	2401447531				2401447532				2401447533				2401447534			
		Sample Date:	2/19/2021				2/19/2021				2/19/2021				2/19/2021			
	Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC																		
	OSW-8260B																	
	1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Vinyl chloride	75-01-4	ND	1.0	ug/l	---	5.8	1.0	ug/l	---	1.6	1.0	ug/l	---	5.7	1.0	ug/l	---
	OSW-8260BBSim																	
	1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

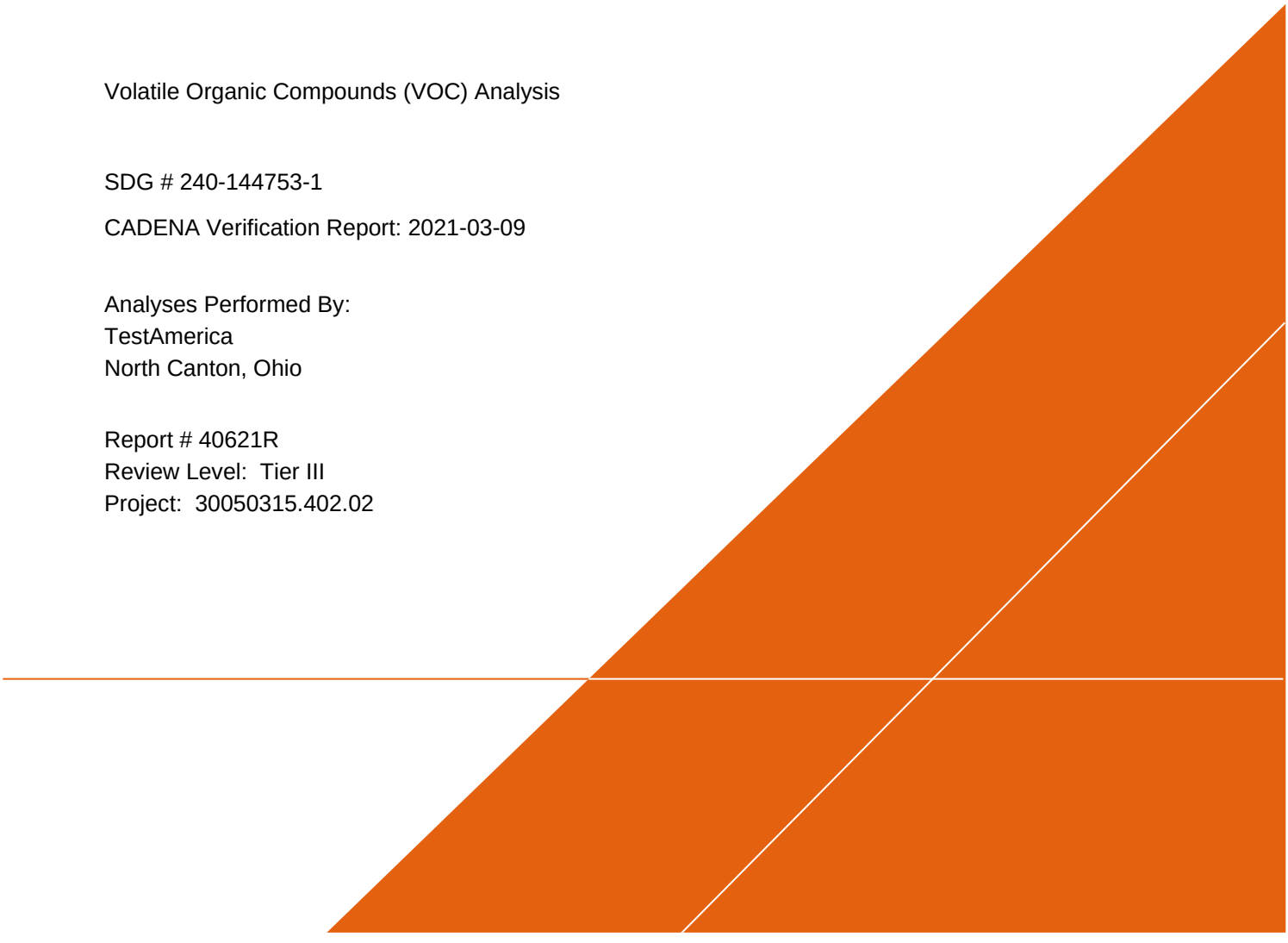
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144753-1

CADENA Verification Report: 2021-03-09

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40621R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144753-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144753-1	Water	02/19/2021		X	
MW-85_021921	240-144753-2	Water	02/19/2021		X	X
MW-85SR_021921	240-144753-3	Water	02/19/2021		X	X
DUP-07	240-144753-4	Water	02/19/2021	MW-85_021921	X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result (µg/L)	Duplicate Result (µg/L)	RPD
MW-85_021921 / DUP-07	Vinyl chloride	5.8	5.7	2%

Notes:

AC – Acceptable

The calculated RPD between the parent sample and field duplicate were acceptable.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

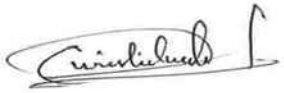
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 18, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 18, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

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TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN
190

TestAmerica Laboratories, Inc.

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Kara Donahue	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client: Lab sampling: Job/SDG No:
Phone: 248-994-2240	Method of Shipment/Carrier:			
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-85_021921	2/19/21	1315		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-85SR_021921	2/19/21	1443		6						6					N	G	X	X	X	X	X	X	X	
Dup-07	2/19/21	—		6						6					N	G	X	X	X	X	X	X	X	

240-144753 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Kara Donahue	Arcadis	2/19/21 1633	Novi Cold Storage	Arcadis	2/19/21 1633
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Arcadis	2/22/21	Amanda Battichel	ETA	2/22/21 1005
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
Amanda Battichel	ETA	2/22/21 11:19		TA	2-23-21 920

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Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144753-1

Date Collected: 02/19/21 00:00
Date Received: 02/23/21 09:20

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 17:14	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 17:14	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 17:14	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 17:14	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 17:14	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 17:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*75 - 130*		*03/01/21 17:14*	*1*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*		*03/01/21 17:14*	*1*
Toluene-d8 (Surr)	*88*		*69 - 122*		*03/01/21 17:14*	*1*
Dibromofluoromethane (Surr)	*108*		*78 - 129*		*03/01/21 17:14*	*1*

Client Sample ID: MW-85_021921

Lab Sample ID: 240-144753-2

Date Collected: 02/19/21 13:15
Date Received: 02/23/21 09:20

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 17:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*70 - 133*		*02/26/21 17:34*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 17:39	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 17:39	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 17:39	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 17:39	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 17:39	1
Vinyl chloride	**5.8**		1.0	0.20	ug/L			03/01/21 17:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*75 - 130*		*03/01/21 17:39*	*1*
4-Bromofluorobenzene (Surr)	*102*		*47 - 134*		*03/01/21 17:39*	*1*
Toluene-d8 (Surr)	*91*		*69 - 122*		*03/01/21 17:39*	*1*
Dibromofluoromethane (Surr)	*105*		*78 - 129*		*03/01/21 17:39*	*1*

Client Sample ID: MW-85SR_021921

Lab Sample ID: 240-144753-3

Date Collected: 02/19/21 14:43
Date Received: 02/23/21 09:20

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 17:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 133*		*02/26/21 17:59*	*1*

Client Sample ID: MW-85SR_021921
Lab Sample ID: 240-144753-3

Date Collected: 02/19/21 14:43
Matrix: Water
Date Received: 02/23/21 09:20

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 18:04	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 18:04	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 18:04	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 18:04	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 18:04	1
Vinyl chloride	**1.6**		1.0	0.20	ug/L			03/01/21 18:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*03/01/21 18:04*	*1*
4-Bromofluorobenzene (Surr)	*101*		*47 - 134*		*03/01/21 18:04*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*03/01/21 18:04*	*1*
Dibromofluoromethane (Surr)	*101*		*78 - 129*		*03/01/21 18:04*	*1*

Client Sample ID: DUP-07
Lab Sample ID: 240-144753-4

Date Collected: 02/19/21 00:00
Matrix: Water
Date Received: 02/23/21 09:20

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 18:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*70 - 133*		*02/26/21 18:24*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 18:28	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 18:28	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 18:28	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 18:28	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 18:28	1
Vinyl chloride	**5.7**		1.0	0.20	ug/L			03/01/21 18:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*03/01/21 18:28*	*1*
4-Bromofluorobenzene (Surr)	*102*		*47 - 134*		*03/01/21 18:28*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*03/01/21 18:28*	*1*
Dibromofluoromethane (Surr)	*104*		*78 - 129*		*03/01/21 18:28*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144376-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
2/19/2021 11:44:20 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
Review your project results through TotalAccess
Have a Question? Ask The Expert
Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144376-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144376-1

Job ID: 240-144376-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144376-1

Comments
No additional comments.

Receipt
The samples were received on 2/11/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.3º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144376-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144376-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144376-1	TRIP BLANK	Water	02/09/21 00:00	02/11/21 08:00	
240-144376-2	MW-86S_020921	Water	02/09/21 12:20	02/11/21 08:00	
240-144376-3	MW-86_020921	Water	02/09/21 13:55	02/11/21 08:00	
240-144376-4	MW-87_020921	Water	02/09/21 15:40	02/11/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144376-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144376-1

No Detections.

Client Sample ID: MW-86S_020921 — Lab Sample ID: 240-144376-2

No Detections.

Client Sample ID: MW-86_020921 — Lab Sample ID: 240-144376-3

No Detections.

Client Sample ID: MW-87_020921 — Lab Sample ID: 240-144376-4

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144376-1

Client Sample ID: TRIP BLANK

Date Collected: 02/09/21 00:00
Date Received: 02/11/21 08:00

Lab Sample ID: 240-144376-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 18:34	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 18:34	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 18:34	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 18:34	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 18:34	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 18:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*75 - 130*		*02/15/21 18:34*	*1*
4-Bromofluorobenzene (Surr)	*67*		*47 - 134*		*02/15/21 18:34*	*1*
Toluene-d8 (Surr)	*79*		*69 - 122*		*02/15/21 18:34*	*1*
Dibromofluoromethane (Surr)	*115*		*78 - 129*		*02/15/21 18:34*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144376-1

Client Sample ID: MW-86S_020921
Date Collected: 02/09/21 12:20
Date Received: 02/11/21 08:00

Lab Sample ID: 240-144376-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 13:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/12/21 13:20*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 18:58	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 18:58	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 18:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 18:58	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 18:58	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 18:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*107*		*75 - 130*		*02/15/21 18:58*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*02/15/21 18:58*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*02/15/21 18:58*	*1*
Dibromofluoromethane (Surr)	*116*		*78 - 129*		*02/15/21 18:58*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144376-1

Client Sample ID: MW-86_020921
Date Collected: 02/09/21 13:55
Date Received: 02/11/21 08:00

Lab Sample ID: 240-144376-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 13:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/12/21 13:45*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 19:45	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 19:45	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 19:45	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 19:45	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 19:45	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 19:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*75 - 130*		*02/15/21 19:45*	*1*
4-Bromofluorobenzene (Surr)	*67*		*47 - 134*		*02/15/21 19:45*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*02/15/21 19:45*	*1*
Dibromofluoromethane (Surr)	*118*		*78 - 129*		*02/15/21 19:45*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144376-1

Client Sample ID: MW-87_020921
Date Collected: 02/09/21 15:40
Date Received: 02/11/21 08:00

Lab Sample ID: 240-144376-4
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 15:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*		*02/12/21 15:00*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 19:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 19:22	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 19:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 19:22	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 19:22	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 19:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*75 - 130*		*02/15/21 19:22*	*1*
4-Bromofluorobenzene (Surr)	*67*		*47 - 134*		*02/15/21 19:22*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*02/15/21 19:22*	*1*
Dibromofluoromethane (Surr)	*122*		*78 - 129*		*02/15/21 19:22*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144376-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144376-1	TRIP BLANK	106	67	79	115
240-144376-2	MW-86S_020921	107	65	80	116
240-144376-3	MW-86_020921	108	67	80	118
240-144376-3 MS	MW-86-MS_020921	93	95	93	95
240-144376-3 MSD	MW-86-MSD_020921	86	86	85	91
240-144376-4	MW-87_020921	106	67	80	122
LCS 240-473065/4	Lab Control Sample	89	93	91	93
MB 240-473065/7	Method Blank	103	70	83	105

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144376-2	MW-86S_020921	82
240-144376-3	MW-86_020921	81
240-144376-3 MS	MW-86-MS_020921	83
240-144376-3 MSD	MW-86-MSD_020921	82
240-144376-4	MW-87_020921	84
LCS 240-472900/4	Lab Control Sample	82
MB 240-472900/5	Method Blank	82

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473065/7
Matrix: Water
Analysis Batch: 473065

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 11:48	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 11:48	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 11:48	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 11:48	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 11:48	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 11:48	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*75 - 130*		*02/15/21 11:48*	*1*
4-Bromofluorobenzene (Surr)	*70*		*47 - 134*		*02/15/21 11:48*	*1*
Toluene-d8 (Surr)	*83*		*69 - 122*		*02/15/21 11:48*	*1*
Dibromofluoromethane (Surr)	*105*		*78 - 129*		*02/15/21 11:48*	*1*

Lab Sample ID: LCS 240-473065/4
Matrix: Water
Analysis Batch: 473065

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.81		ug/L		98	73 - 129
cis-1,2-Dichloroethene	10.0	9.60		ug/L		96	75 - 124
Tetrachloroethene	10.0	11.2		ug/L		112	70 - 125
trans-1,2-Dichloroethene	10.0	10.3		ug/L		103	74 - 130
Trichloroethene	10.0	10.1		ug/L		101	71 - 121
Vinyl chloride	10.0	8.27		ug/L		83	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*89*		*75 - 130*
4-Bromofluorobenzene (Surr)	*93*		*47 - 134*
Toluene-d8 (Surr)	*91*		*69 - 122*
Dibromofluoromethane (Surr)	*93*		*78 - 129*

Lab Sample ID: 240-144376-3 MS
Matrix: Water
Analysis Batch: 473065

Client Sample ID: MW-86-MS_020921
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.84		ug/L		98	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	9.69		ug/L		97	68 - 121
Tetrachloroethene	1.0	U	10.0	10.8		ug/L		108	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.85		ug/L		98	69 - 126
Trichloroethene	1.0	U	10.0	9.18		ug/L		92	56 - 124
Vinyl chloride	1.0	U	10.0	8.01		ug/L		80	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144376-3 MS
Matrix: Water
Analysis Batch: 473065

Client Sample ID: MW-86-MS_020921
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*95*		*78 - 129*

Lab Sample ID: 240-144376-3 MSD
Matrix: Water
Analysis Batch: 473065

Client Sample ID: MW-86-MSD_020921
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.36		ug/L		94	64 - 132	5	35
cis-1,2-Dichloroethene	1.0	U	10.0	9.44		ug/L		94	68 - 121	3	35
Tetrachloroethene	1.0	U	10.0	9.39		ug/L		94	52 - 129	14	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.90		ug/L		99	69 - 126	1	35
Trichloroethene	1.0	U	10.0	9.24		ug/L		92	56 - 124	1	35
Vinyl chloride	1.0	U	10.0	8.23		ug/L		82	49 - 136	3	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*
4-Bromofluorobenzene (Surr)	*86*		*47 - 134*
Toluene-d8 (Surr)	*85*		*69 - 122*
Dibromofluoromethane (Surr)	*91*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-472900/5
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 12:29	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/12/21 12:29*	*1*

Lab Sample ID: LCS 240-472900/4
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.6		ug/L		106	80 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144376-3 MS
Matrix: Water
Analysis Batch: 472900

Client Sample ID: MW-86-MS_020921
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	10.8		ug/L		108	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*

Lab Sample ID: 240-144376-3 MSD
Matrix: Water
Analysis Batch: 472900

Client Sample ID: MW-86-MSD_020921
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.8		ug/L		108	46 - 170	1	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144376-1

GC/MS VOA

Analysis Batch: 472900

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144376-2	MW-86S_020921	Total/NA	Water	8260B SIM	
240-144376-3	MW-86_020921	Total/NA	Water	8260B SIM	
240-144376-4	MW-87_020921	Total/NA	Water	8260B SIM	
MB 240-472900/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-472900/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144376-3 MS	MW-86-MS_020921	Total/NA	Water	8260B SIM	
240-144376-3 MSD	MW-86-MSD_020921	Total/NA	Water	8260B SIM	

Analysis Batch: 473065

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144376-1	TRIP BLANK	Total/NA	Water	8260B	
240-144376-2	MW-86S_020921	Total/NA	Water	8260B	
240-144376-3	MW-86_020921	Total/NA	Water	8260B	
240-144376-4	MW-87_020921	Total/NA	Water	8260B	
MB 240-473065/7	Method Blank	Total/NA	Water	8260B	
LCS 240-473065/4	Lab Control Sample	Total/NA	Water	8260B	
240-144376-3 MS	MW-86-MS_020921	Total/NA	Water	8260B	
240-144376-3 MSD	MW-86-MSD_020921	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144376-1

Client Sample ID: TRIP BLANK
Date Collected: 02/09/21 00:00
Date Received: 02/11/21 08:00

Lab Sample ID: 240-144376-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473065	02/15/21 18:34	LRW	TAL CAN

Client Sample ID: MW-86S_020921
Date Collected: 02/09/21 12:20
Date Received: 02/11/21 08:00

Lab Sample ID: 240-144376-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473065	02/15/21 18:58	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	472900	02/12/21 13:20	SAM	TAL CAN

Client Sample ID: MW-86_020921
Date Collected: 02/09/21 13:55
Date Received: 02/11/21 08:00

Lab Sample ID: 240-144376-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473065	02/15/21 19:45	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	472900	02/12/21 13:45	SAM	TAL CAN

Client Sample ID: MW-87_020921
Date Collected: 02/09/21 15:40
Date Received: 02/11/21 08:00

Lab Sample ID: 240-144376-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473065	02/15/21 19:22	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	472900	02/12/21 15:00	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144376-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

MICHIGAN 190

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		
City/State/Zip: Novi, MI, 48377	Sampler Name: Allyson Haitz	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day — 10 day		For lab use only: Walk-in client; Lab sampling; Job/SDG No:
Phone: 248-994-2240	Method of Shipment/Carrier:			
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 tripblank
MW-86S_020921	2/9/21	12:20		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B; 3 VOAs for 8260B SIM
MW-86-MS_020921	2/9/21	13:55		6						6					N	G	X	X	X	X	X	X	X	run MS/MSD
MW-86-MSD_020921	2/9/21	13:55		6						6					N	G	X	X	X	X	X	X	X	run MS/MSD
MW-86_020921	2/9/21	13:55		6						6					N	G	X	X	X	X	X	X	X	
MW-87_020921	2/9/21	15:40		6						6					N	G	X	X	X	X	X	X	X	

240-144376 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Allyson Haitz	Arcadis	2/9/21 17:30	Novi Cold Storage	Arcadis	2/9/21 17:30
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[illegible]	Arcadis	2/10/2021	Amanda Battershell	ETA	2/10/21 10:12
Relinquished by: Amanda Battershell	Company: ETA	Date/Time: 2/10/21 1309	Received in Laboratory by:	Company: ETA	Date/Time: 2-11-21 800

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2/19/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 144376
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Matt

Cooler Received on 2-11-21 Opened on 2-11-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # 729 Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp 2.2 °C Corrected Cooler Temp 2.3 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
   -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? Yes No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)? Y
10. Were correct bottle(s) used for the test(s) indicated? Yes No
11. Sufficient quantity received to perform indicated analyses? Yes No
12. Are these work share samples and all listed on the COC? Yes No
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC907861
14. Were VOAs on the COC? Yes No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 330310F Yes No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT



February 19, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144376-1
Sample date: 2021-02-09
Report received by CADENA: 2021-02-19
Initial Data Verification completed by CADENA: 2021-02-19
Number of Samples:4
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, MS/MSD Recovery, MS/MSD RPD, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144376-1

		Sample Name:	TRIP BLANK				MW-86S_020921				MW-86_020921				MW-87_020921			
		Lab Sample ID:	2401443761				2401443762				2401443763				2401443764			
		Sample Date:	2/9/2021				2/9/2021				2/9/2021				2/9/2021			
	Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC																		
	OSW-8260B																	
	1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	OSW-8260BBSim																	
	1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS Design & Consultancy for natural and built assets

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

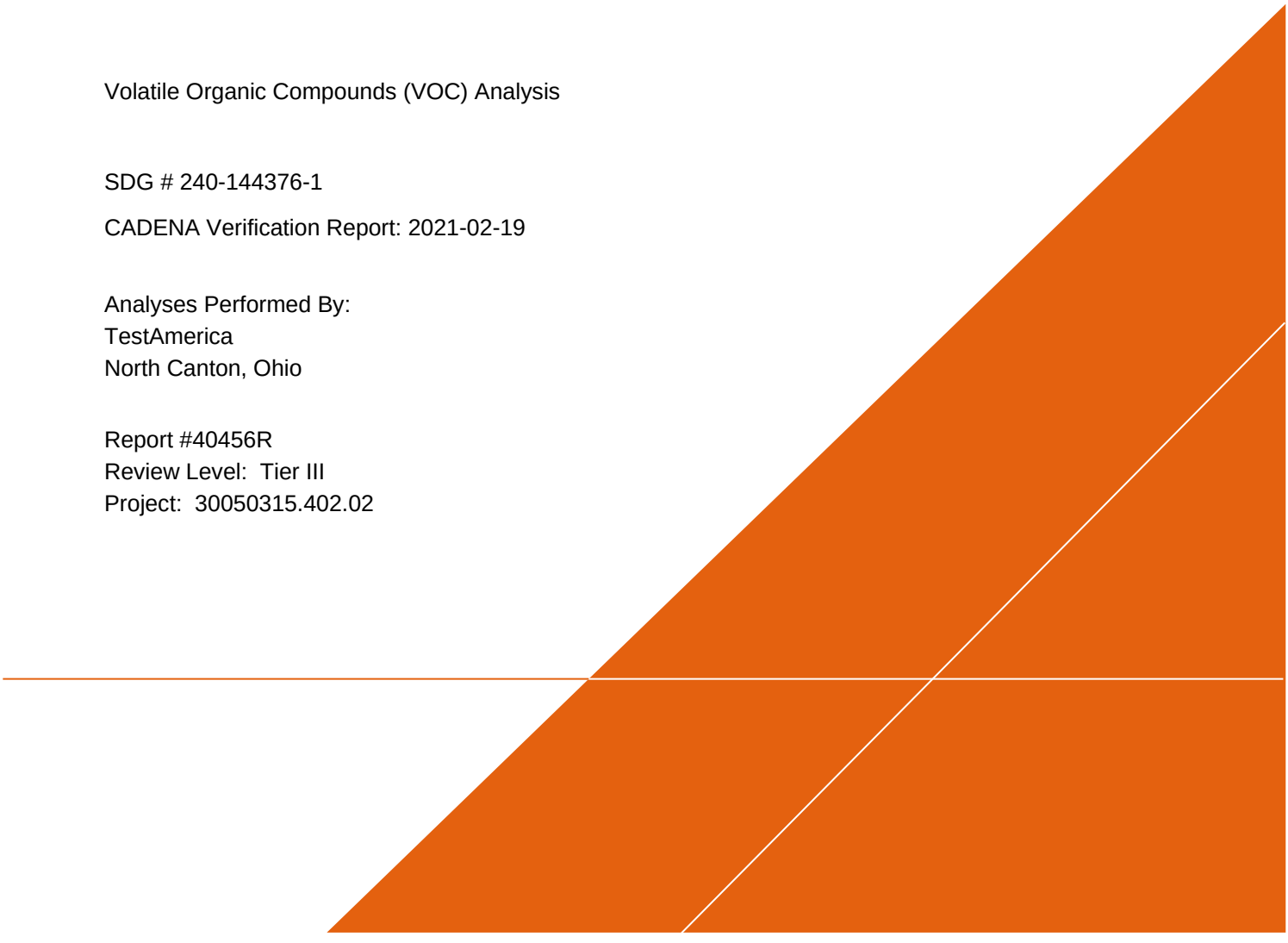
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144376-1

CADENA Verification Report: 2021-02-19

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report #40456R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144376-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					VOC
TRIP BLANK	240-144376-1	Water	02/09/2021		X
MW-86S_020921	240-144376-2	Water	02/09/2021		X
MW-86_020921	240-144376-3	Water	02/09/2021		X
MW-87_020921	240-144376-4	Water	02/09/2021		X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Prashanth K

SIGNATURE: 

DATE: March 08, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 10, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com			
Phone: 248-994-2240	Sampler Name: Allyson Hartz	Analysis Turnaround Time		For lab use only
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:	TAT if different from below: ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client:
Project Number: 30050315.402.04		10 day		Lab sampling:
PO # 30050315.402.04	Shipping/Tracking No:			Job/SDG No:

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 trip blank
MW-86S_020921	2/9/21	12:20		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-86-MS_020921	2/9/21	13:55		6						6					N	G	X	X	X	X	X	X	X	run MS/MSD
MW-86-MSD_020921	2/9/21	13:55		6						6					N	G	X	X	X	X	X	X	X	run MS/MSD
MW-86_020921	2/9/21	13:55		6						6					N	G	X	X	X	X	X	X	X	
MW-87_020921	2/9/21	15:40		6						6					N	G	X	X	X	X	X	X	X	

240-144376 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Allyson Hartz	Arcadis	2/9/21 17:30	Ncvl cold storage	Arcadis	2/9/21 17:30
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	2/10/2021	[signature]	ETA	AD 2/10/21 10:12
Relinquished by: [signature]	Company: ETA	Date/Time: 2/10/21 1309	Received in Laboratory by: [signature]	Company: ETA	Date/Time: 2-11-21 800

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02/19/2021

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144376-1

Date Collected: 02/09/21 00:00
Matrix: Water
Date Received: 02/11/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 18:34	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 18:34	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 18:34	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 18:34	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 18:34	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 18:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*75 - 130*		*02/15/21 18:34*	*1*
4-Bromofluorobenzene (Surr)	*67*		*47 - 134*		*02/15/21 18:34*	*1*
Toluene-d8 (Surr)	*79*		*69 - 122*		*02/15/21 18:34*	*1*
Dibromofluoromethane (Surr)	*115*		*78 - 129*		*02/15/21 18:34*	*1*

Client Sample ID: MW-86S_020921

Lab Sample ID: 240-144376-2

Date Collected: 02/09/21 12:20
Matrix: Water
Date Received: 02/11/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 13:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/12/21 13:20*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 18:58	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 18:58	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 18:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 18:58	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 18:58	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 18:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*107*		*75 - 130*		*02/15/21 18:58*	*1*
4-Bromofluorobenzene (Surr)	*65*		*47 - 134*		*02/15/21 18:58*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*02/15/21 18:58*	*1*
Dibromofluoromethane (Surr)	*116*		*78 - 129*		*02/15/21 18:58*	*1*

Client Sample ID: MW-86_020921

Lab Sample ID: 240-144376-3

Date Collected: 02/09/21 13:55
Matrix: Water
Date Received: 02/11/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 13:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/12/21 13:45*	*1*

Client Sample ID: MW-86_020921
Lab Sample ID: 240-144376-3
Date Collected: 02/09/21 13:55
Matrix: Water
Date Received: 02/11/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 19:45	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 19:45	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 19:45	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 19:45	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 19:45	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 19:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*75 - 130*		*02/15/21 19:45*	*1*
4-Bromofluorobenzene (Surr)	*67*		*47 - 134*		*02/15/21 19:45*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*02/15/21 19:45*	*1*
Dibromofluoromethane (Surr)	*118*		*78 - 129*		*02/15/21 19:45*	*1*

Client Sample ID: MW-87_020921
Lab Sample ID: 240-144376-4
Date Collected: 02/09/21 15:40
Matrix: Water
Date Received: 02/11/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 15:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*		*02/12/21 15:00*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 19:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 19:22	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 19:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 19:22	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 19:22	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 19:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*75 - 130*		*02/15/21 19:22*	*1*
4-Bromofluorobenzene (Surr)	*67*		*47 - 134*		*02/15/21 19:22*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*02/15/21 19:22*	*1*
Dibromofluoromethane (Surr)	*122*		*78 - 129*		*02/15/21 19:22*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144568-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/3/2021 10:28:14 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144568-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
S1-	Surrogate recovery exceeds control limits, low biased.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144568-1

Job ID: 240-144568-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144568-1

Comments
No additional comments.

Receipt
The samples were received on 2/17/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.5º C.

GC/MS VOA
Method 8260B: The laboratory control sample (LCS) for analytical batch 240-474305 recovered outside control limits for the following analyte: Tetrachloroethane. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data has been reported: MW-87S_021521 (240-144568-3) and (LCS 240-474305/4).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144568-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144568-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144568-1	TRIP BLANK	Water	02/15/21 00:00	02/17/21 08:00	
240-144568-2	MW-99S_021521	Water	02/15/21 12:10	02/17/21 08:00	
240-144568-3	MW-87S_021521	Water	02/15/21 14:00	02/17/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144568-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144568-1

No Detections.

Client Sample ID: MW-99S_021521 — Lab Sample ID: 240-144568-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	0.43	J	1.0	0.16	ug/L	1		8260B	Total/NA

Client Sample ID: MW-87S_021521 — Lab Sample ID: 240-144568-3

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144568-1

Client Sample ID: TRIP BLANK
Date Collected: 02/15/21 00:00
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144568-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 16:10	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 16:10	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 16:10	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 16:10	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 16:10	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 16:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*75 - 130*		*02/24/21 16:10*	*1*
4-Bromofluorobenzene (Surr)	*100*		*47 - 134*		*02/24/21 16:10*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*02/24/21 16:10*	*1*
Dibromofluoromethane (Surr)	*92*		*78 - 129*		*02/24/21 16:10*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144568-1

Client Sample ID: MW-99S_021521
Date Collected: 02/15/21 12:10
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144568-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/24/21 19:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*		*02/24/21 19:26*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 16:35	1
cis-1,2-Dichloroethene	**0.43**	**J**	1.0	0.16	ug/L			02/24/21 16:35	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 16:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 16:35	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 16:35	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 16:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 130*		*02/24/21 16:35*	*1*
4-Bromofluorobenzene (Surr)	*98*		*47 - 134*		*02/24/21 16:35*	*1*
Toluene-d8 (Surr)	*94*		*69 - 122*		*02/24/21 16:35*	*1*
Dibromofluoromethane (Surr)	*90*		*78 - 129*		*02/24/21 16:35*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144568-1

Client Sample ID: MW-87S_021521
Date Collected: 02/15/21 14:00
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144568-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 13:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/25/21 13:34*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 22:17	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 22:17	1
Tetrachloroethene	1.0	U *+	1.0	0.15	ug/L			02/24/21 22:17	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 22:17	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 22:17	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 22:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*		*02/24/21 22:17*	*1*
4-Bromofluorobenzene (Surr)	*63*		*47 - 134*		*02/24/21 22:17*	*1*
Toluene-d8 (Surr)	*79*		*69 - 122*		*02/24/21 22:17*	*1*
Dibromofluoromethane (Surr)	*119*		*78 - 129*		*02/24/21 22:17*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144568-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144568-1	TRIP BLANK	91	100	93	92
240-144568-2	MW-99S_021521	88	98	94	90
240-144568-2 MS	MW-99S-MS_021521	87	98	93	89
240-144568-2 MSD	MW-99S-MSD_021521	86	100	92	91
240-144568-3	MW-87S_021521	97	63	79	119
240-144568-3 MS	MW-87S-MS_021521	71 S1-	86	92	87
240-144568-3 MSD	MW-87S-MSD_021521	69 S1-	91	93	88
LCS 240-474305/4	Lab Control Sample	88	87	89	91
LCS 240-474307/4	Lab Control Sample	84	101	92	89
MB 240-474305/7	Method Blank	98	67	84	103
MB 240-474307/7	Method Blank	87	103	92	89

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144568-2	MW-99S_021521	84
240-144568-2 MS	MW-99S-MS_021521	81
240-144568-2 MSD	MW-99S-MSD_021521	82
240-144568-3	MW-87S_021521	81
240-144568-3 MS	MW-87S-MS_021521	79
240-144568-3 MSD	MW-87S-MSD_021521	83
LCS 240-474283/4	Lab Control Sample	84
LCS 240-474490/4	Lab Control Sample	79
MB 240-474283/5	Method Blank	86
MB 240-474490/5	Method Blank	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474305/7
Matrix: Water
Analysis Batch: 474305

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 14:13	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 14:13	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 14:13	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 14:13	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 14:13	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 14:13	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 130*		*02/24/21 14:13*	*1*
4-Bromofluorobenzene (Surr)	*67*		*47 - 134*		*02/24/21 14:13*	*1*
Toluene-d8 (Surr)	*84*		*69 - 122*		*02/24/21 14:13*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*02/24/21 14:13*	*1*

Lab Sample ID: LCS 240-474305/4
Matrix: Water
Analysis Batch: 474305

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.8		ug/L		108	73 - 129
cis-1,2-Dichloroethene	10.0	9.69		ug/L		97	75 - 124
Tetrachloroethene	10.0	12.6	*+	ug/L		126	70 - 125
trans-1,2-Dichloroethene	10.0	11.0		ug/L		110	74 - 130
Trichloroethene	10.0	10.3		ug/L		103	71 - 121
Vinyl chloride	10.0	9.04		ug/L		90	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 130*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*
Toluene-d8 (Surr)	*89*		*69 - 122*
Dibromofluoromethane (Surr)	*91*		*78 - 129*

Lab Sample ID: 240-144568-3 MS
Matrix: Water
Analysis Batch: 474305

Client Sample ID: MW-87S-MS_021521
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.41		ug/L		94	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	8.71		ug/L		87	68 - 121
Tetrachloroethene	1.0	U *+	10.0	11.6		ug/L		116	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.81		ug/L		98	69 - 126
Trichloroethene	1.0	U	10.0	9.03		ug/L		90	56 - 124
Vinyl chloride	1.0	U	10.0	8.44		ug/L		84	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*71*	*S1-*	*75 - 130*
4-Bromofluorobenzene (Surr)	*86*		*47 - 134*
Toluene-d8 (Surr)	*92*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144568-3 MS
Matrix: Water
Analysis Batch: 474305

Client Sample ID: MW-87S-MS_021521
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*87*		*78 - 129*

Lab Sample ID: 240-144568-3 MSD
Matrix: Water
Analysis Batch: 474305

Client Sample ID: MW-87S-MSD_021521
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.22		ug/L		92	64 - 132	2	35
cis-1,2-Dichloroethene	1.0	U	10.0	8.56		ug/L		86	68 - 121	2	35
Tetrachloroethene	1.0	U *+	10.0	11.0		ug/L		110	52 - 129	6	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.16		ug/L		92	69 - 126	7	35
Trichloroethene	1.0	U	10.0	8.83		ug/L		88	56 - 124	2	35
Vinyl chloride	1.0	U	10.0	8.72		ug/L		87	49 - 136	3	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*69*	*S1-*	*75 - 130*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*88*		*78 - 129*

Lab Sample ID: MB 240-474307/7
Matrix: Water
Analysis Batch: 474307

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 14:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 14:06	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 14:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 14:06	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 14:06	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 14:06	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 130*		*02/24/21 14:06*	*1*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*		*02/24/21 14:06*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*02/24/21 14:06*	*1*
Dibromofluoromethane (Surr)	*89*		*78 - 129*		*02/24/21 14:06*	*1*

Lab Sample ID: LCS 240-474307/4
Matrix: Water
Analysis Batch: 474307

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.71		ug/L		97	73 - 129
cis-1,2-Dichloroethene	10.0	10.6		ug/L		106	75 - 124
Tetrachloroethene	10.0	9.87		ug/L		99	70 - 125
trans-1,2-Dichloroethene	10.0	10.3		ug/L		103	74 - 130
Trichloroethene	10.0	9.93		ug/L		99	71 - 121

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-474307/4
Matrix: Water
Analysis Batch: 474307

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Vinyl chloride			10.0	11.5		ug/L		115	61 - 134		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*
4-Bromofluorobenzene (Surr)	*101*		*47 - 134*
Toluene-d8 (Surr)	*92*		*69 - 122*
Dibromofluoromethane (Surr)	*89*		*78 - 129*

Lab Sample ID: 240-144568-2 MS
Matrix: Water
Analysis Batch: 474307

Client Sample ID: MW-99S-MS_021521
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,1-Dichloroethene	1.0	U	10.0	9.77		ug/L		98	64 - 132		
cis-1,2-Dichloroethene	0.43	J	10.0	10.1		ug/L		97	68 - 121		
Tetrachloroethene	1.0	U	10.0	9.57		ug/L		96	52 - 129		
trans-1,2-Dichloroethene	1.0	U	10.0	9.78		ug/L		98	69 - 126		
Trichloroethene	1.0	U	10.0	9.70		ug/L		97	56 - 124		
Vinyl chloride	1.0	U	10.0	11.4		ug/L		114	49 - 136		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 130*
4-Bromofluorobenzene (Surr)	*98*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*89*		*78 - 129*

Lab Sample ID: 240-144568-2 MSD
Matrix: Water
Analysis Batch: 474307

Client Sample ID: MW-99S-MSD_021521
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.63		ug/L		96	64 - 132	1	35
cis-1,2-Dichloroethene	0.43	J	10.0	10.2		ug/L		98	68 - 121	1	35
Tetrachloroethene	1.0	U	10.0	8.84		ug/L		88	52 - 129	8	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.59		ug/L		96	69 - 126	2	35
Trichloroethene	1.0	U	10.0	9.53		ug/L		95	56 - 124	2	35
Vinyl chloride	1.0	U	10.0	11.7		ug/L		117	49 - 136	2	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*
4-Bromofluorobenzene (Surr)	*100*		*47 - 134*
Toluene-d8 (Surr)	*92*		*69 - 122*
Dibromofluoromethane (Surr)	*91*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474283/5
Matrix: Water
Analysis Batch: 474283

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/24/21 11:01	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*		*02/24/21 11:01*	*1*

Lab Sample ID: LCS 240-474283/4
Matrix: Water
Analysis Batch: 474283

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.5		ug/L		105	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*

Lab Sample ID: 240-144568-2 MS
Matrix: Water
Analysis Batch: 474283

Client Sample ID: MW-99S-MS_021521
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	9.90		ug/L		99	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

Lab Sample ID: 240-144568-2 MSD
Matrix: Water
Analysis Batch: 474283

Client Sample ID: MW-99S-MSD_021521
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.89		ug/L		99	46 - 170	0	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: MB 240-474490/5
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 12:43	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/25/21 12:43*	*1*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-474490/4
Matrix: Water
Analysis Batch: 474490

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.7		ug/L		107	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*

Lab Sample ID: 240-144568-3 MS
Matrix: Water
Analysis Batch: 474490

Client Sample ID: MW-87S-MS_021521
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	10.2		ug/L		102	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*

Lab Sample ID: 240-144568-3 MSD
Matrix: Water
Analysis Batch: 474490

Client Sample ID: MW-87S-MSD_021521
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.2		ug/L		102	46 - 170	0	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144568-1

GC/MS VOA

Analysis Batch: 474283

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144568-2	MW-99S_021521	Total/NA	Water	8260B SIM	
MB 240-474283/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474283/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144568-2 MS	MW-99S-MS_021521	Total/NA	Water	8260B SIM	
240-144568-2 MSD	MW-99S-MSD_021521	Total/NA	Water	8260B SIM	

Analysis Batch: 474305

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144568-3	MW-87S_021521	Total/NA	Water	8260B	
MB 240-474305/7	Method Blank	Total/NA	Water	8260B	
LCS 240-474305/4	Lab Control Sample	Total/NA	Water	8260B	
240-144568-3 MS	MW-87S-MS_021521	Total/NA	Water	8260B	
240-144568-3 MSD	MW-87S-MSD_021521	Total/NA	Water	8260B	

Analysis Batch: 474307

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144568-1	TRIP BLANK	Total/NA	Water	8260B	
240-144568-2	MW-99S_021521	Total/NA	Water	8260B	
MB 240-474307/7	Method Blank	Total/NA	Water	8260B	
LCS 240-474307/4	Lab Control Sample	Total/NA	Water	8260B	
240-144568-2 MS	MW-99S-MS_021521	Total/NA	Water	8260B	
240-144568-2 MSD	MW-99S-MSD_021521	Total/NA	Water	8260B	

Analysis Batch: 474490

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144568-3	MW-87S_021521	Total/NA	Water	8260B SIM	
MB 240-474490/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474490/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144568-3 MS	MW-87S-MS_021521	Total/NA	Water	8260B SIM	
240-144568-3 MSD	MW-87S-MSD_021521	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144568-1

Client Sample ID: TRIP BLANK
Date Collected: 02/15/21 00:00
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144568-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474307	02/24/21 16:10	LRW	TAL CAN

Client Sample ID: MW-99S_021521
Date Collected: 02/15/21 12:10
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144568-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474307	02/24/21 16:35	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474283	02/24/21 19:26	SAM	TAL CAN

Client Sample ID: MW-87S_021521
Date Collected: 02/15/21 14:00
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144568-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474305	02/24/21 22:17	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474490	02/25/21 13:34	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144568-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

0-4165

Chain of Custody Record

MICHIGAN TestAmerica 190
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton -- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Allyson Hartz	TAT if different from below: ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client: Lab sampling: Job/SDG No:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			
Project Number: 30050315.402.04	Shipping/Tracking No:			
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 TRIP BLANK
MW-995_021521	2/15/21	12:10		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-995-MS_021521	2/15/21	12:10		6						6					N	G	X	X	X	X	X	X	X	run MS/MSD
MW-995-MSD_021521	2/15/21	12:10		6						6					N	G	X	X	X	X	X	X	X	run MS/MSD
MW-875_021521	2/15/21	14:00		6						6					N	G	X	X	X	X	X	X	X	
MW-875-MS_021521	2/15/21	14:00		6						6					N	G	X	X	X	X	X	X	X	run MS/MSD
MW-875-MSD_021521	2/15/21	14:00		6						6					N	G	X	X	X	X	X	X	X	run MS/MSD

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be ass: ☐ Return to Client ☑ Disp

240-144568 Chain of Custody

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	2/15/21 15:30	Novi cold storage	Arcadis	2/15/21 15:30
[signature]	ARCADIS	2/16/21 / 1009	[signature]	ETA	2/16/21 / 10:09
[signature]	ETA	2/16/21 12:40	Received in Laboratory by: [signature]	ETA	Date/Time: 2-17-21 830

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3/3/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 144568**
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Matt Smith

Cooler Received on 2-17-21 Opened on 2-17-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # 1 Foam Box Client Cooler Box Other _____

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form

IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 0.4 °C Corrected Cooler Temp. 0.5 °C

IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   - -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   - -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   - -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? (Yes) No
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)? (Y) (Y) (Y)
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)

If yes, Questions 13-17 have been checked at the originating laboratory.

13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# **HC907861**
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #_____ (Yes) No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

_____

_____

_____

_____

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT



March 03, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144568-1
Sample date: 2021-02-15
Report received by CADENA: 2021-03-03
Initial Data Verification completed by CADENA: 2021-03-03
Number of Samples:3
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 474305 LCS recovery was outlying biased high for the following analyte: TETRACHLOROETHENE. Associated client sample results were non-detect so qualification was not required based on this high bias QC outlier.

GCMS VOC sample -003 MS/MSD surrogate recovery outliers did not result in qualification of client sample data.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, MS/MSD Recovery, MS/MSD RPD, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144568-1

		Sample Name:	TRIP BLANK				MW-99S_021521				MW-87S_021521			
		Lab Sample ID:	2401445681				2401445682				2401445683			
		Sample Date:	2/15/2021				2/15/2021				2/15/2021			
	Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC														
	OSW-8260B													
	1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	0.43	1.0	ug/l	J	ND	1.0	ug/l	---
	Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	OSW-8260BBSim													
	1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

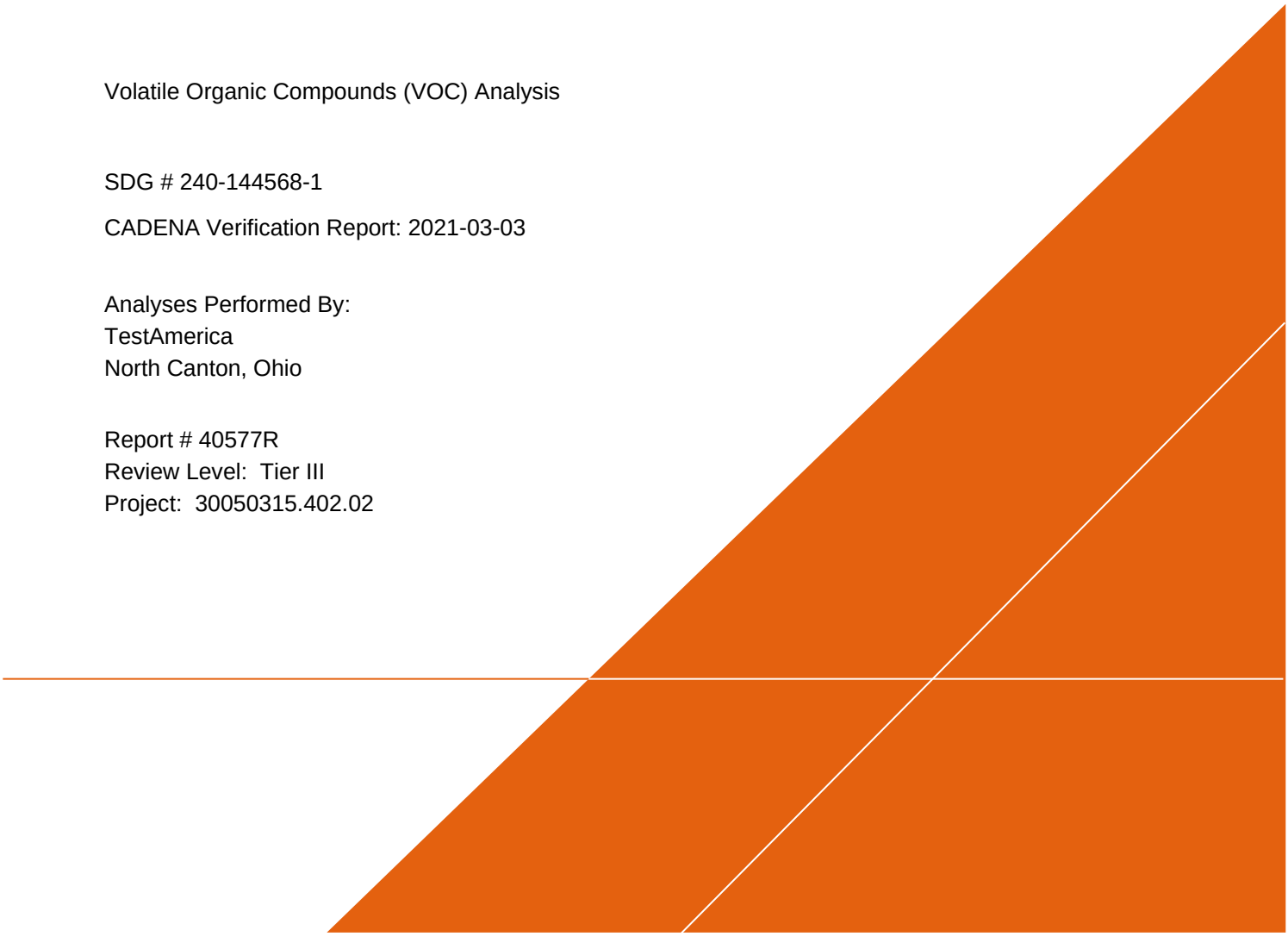
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144568-1

CADENA Verification Report: 2021-03-03

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40577R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144568-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144568-1	Water	02/15/2021		X	
MW-99S_021521	240-144568-2	Water	02/15/2021		X	X
MW-87S_021521	240-144568-3	Water	02/15/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial/Continuing	Lab file ID	Compound	Criteria
MW-87S_021521	CCV %D	UXR3152.D	Tetrachloroethene	+30.7%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action

Initial/Continuing	Criteria	Sample Result	Qualification
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1] RRF of 0.01 only applies to compounds which are typically poor responding compounds (i.e., ketones, 1,4-dioxane, etc.)

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

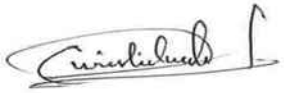
%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 17, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

0-4/65

Chain of Custody Record

MICHIGAN TestAmerica 190
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton -- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Allyson Hartz	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client:
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 TRIP BLANK
MW-995_021521	2/15/21	12:10		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-995-MS_021521	2/15/21	12:10		6						6					N	G	X	X	X	X	X	X	X	run MS/MSD
MW-995-MSD_021521	2/15/21	12:10		6						6					N	G	X	X	X	X	X	X	X	run MS/MSD
MW-875_021521	2/15/21	14:00		6						6					N	G	X	X	X	X	X	X	X	
MW-875-MS_021521	2/15/21	14:00		6						6					N	G	X	X	X	X	X	X	X	run MS/MSD
MW-875-MSD_021521	2/15/21	14:00		6						6					N	G	X	X	X	X	X	X	X	run MS/MSD

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal by Lab

240-144568 Chain of Custody

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
	Arcadis	2/15/21 15:30	Novi Cold Storage	Arcadis	2/15/21 15:30
	ARCADIS	2/16/21 / 1009		ETA	2/16/21 / 10:09
	ETA	2/16/21 12:40		ETA	2-17-21 820

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03/03/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144568-1
Date Collected: 02/15/21 00:00
Matrix: Water
Date Received: 02/17/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 16:10	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 16:10	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 16:10	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 16:10	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 16:10	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 16:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*75 - 130*		*02/24/21 16:10*	*1*
4-Bromofluorobenzene (Surr)	*100*		*47 - 134*		*02/24/21 16:10*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*02/24/21 16:10*	*1*
Dibromofluoromethane (Surr)	*92*		*78 - 129*		*02/24/21 16:10*	*1*

Client Sample ID: MW-99S_021521
Lab Sample ID: 240-144568-2
Date Collected: 02/15/21 12:10
Matrix: Water
Date Received: 02/17/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/24/21 19:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*		*02/24/21 19:26*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 16:35	1
cis-1,2-Dichloroethene	**0.43**	**J**	1.0	0.16	ug/L			02/24/21 16:35	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 16:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 16:35	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 16:35	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 16:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 130*		*02/24/21 16:35*	*1*
4-Bromofluorobenzene (Surr)	*98*		*47 - 134*		*02/24/21 16:35*	*1*
Toluene-d8 (Surr)	*94*		*69 - 122*		*02/24/21 16:35*	*1*
Dibromofluoromethane (Surr)	*90*		*78 - 129*		*02/24/21 16:35*	*1*

Client Sample ID: MW-87S_021521
Lab Sample ID: 240-144568-3
Date Collected: 02/15/21 14:00
Matrix: Water
Date Received: 02/17/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/25/21 13:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/25/21 13:34*	*1*

Client Sample ID: MW-87S_021521
Lab Sample ID: 240-144568-3

Date Collected: 02/15/21 14:00
Matrix: Water

Date Received: 02/17/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 22:17	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 22:17	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 22:17	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 22:17	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 22:17	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 22:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*		*02/24/21 22:17*	*1*
4-Bromofluorobenzene (Surr)	*63*		*47 - 134*		*02/24/21 22:17*	*1*
Toluene-d8 (Surr)	*79*		*69 - 122*		*02/24/21 22:17*	*1*
Dibromofluoromethane (Surr)	*119*		*78 - 129*		*02/24/21 22:17*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144806-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/10/2021 9:00:59 AM

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Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144806-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144806-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144806-1

Comments
No additional comments.

Receipt
The samples were received on 2/24/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.3º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144806-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144806-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144806-1	TRIP BLANK	Water	02/19/21 00:00	02/24/21 08:00	
240-144806-2	MW-98S_021921	Water	02/19/21 12:11	02/24/21 08:00	
240-144806-3	MW-139S_021921	Water	02/19/21 13:31	02/24/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144806-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144806-1

No Detections.

Client Sample ID: MW-98S_021921 — Lab Sample ID: 240-144806-2

No Detections.

Client Sample ID: MW-139S_021921 — Lab Sample ID: 240-144806-3

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144806-1

Client Sample ID: TRIP BLANK

Date Collected: 02/19/21 00:00
Date Received: 02/24/21 08:00

Lab Sample ID: 240-144806-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 23:00	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 23:00	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 23:00	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 23:00	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 23:00	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 23:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*75 - 130*		*03/01/21 23:00*	*1*
4-Bromofluorobenzene (Surr)	*64*		*47 - 134*		*03/01/21 23:00*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*03/01/21 23:00*	*1*
Dibromofluoromethane (Surr)	*110*		*78 - 129*		*03/01/21 23:00*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144806-1

Client Sample ID: MW-98S_021921
Date Collected: 02/19/21 12:11
Date Received: 02/24/21 08:00

Lab Sample ID: 240-144806-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 13:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*70 - 133*		*03/01/21 13:27*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 20:13	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 20:13	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 20:13	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 20:13	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 20:13	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 20:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*75 - 130*		*03/01/21 20:13*	*1*
4-Bromofluorobenzene (Surr)	*67*		*47 - 134*		*03/01/21 20:13*	*1*
Toluene-d8 (Surr)	*84*		*69 - 122*		*03/01/21 20:13*	*1*
Dibromofluoromethane (Surr)	*106*		*78 - 129*		*03/01/21 20:13*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144806-1

Client Sample ID: MW-139S_021921
Date Collected: 02/19/21 13:31
Date Received: 02/24/21 08:00

Lab Sample ID: 240-144806-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 13:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*70 - 133*		*03/01/21 13:52*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 20:37	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 20:37	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 20:37	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 20:37	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 20:37	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 20:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*75 - 130*		*03/01/21 20:37*	*1*
4-Bromofluorobenzene (Surr)	*63*		*47 - 134*		*03/01/21 20:37*	*1*
Toluene-d8 (Surr)	*82*		*69 - 122*		*03/01/21 20:37*	*1*
Dibromofluoromethane (Surr)	*110*		*78 - 129*		*03/01/21 20:37*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144806-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144806-1	TRIP BLANK	116	64	80	110
240-144806-2	MW-98S_021921	106	67	84	106
240-144806-3	MW-139S_021921	110	63	82	110
240-144807-G-4 MS	Matrix Spike	92	91	89	96
240-144807-H-4 MSD	Matrix Spike Duplicate	86	91	88	90
LCS 240-474892/4	Lab Control Sample	88	89	89	89
MB 240-474892/7	Method Blank	104	70	82	110

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144806-2	MW-98S_021921	85
240-144806-3	MW-139S_021921	89
240-144807-J-4 MS	Matrix Spike	90
240-144807-J-4 MSD	Matrix Spike Duplicate	88
LCS 240-474842/4	Lab Control Sample	90
MB 240-474842/5	Method Blank	86

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474892/7
Matrix: Water
Analysis Batch: 474892

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 15:51	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 15:51	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 15:51	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 15:51	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 15:51	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 15:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*03/01/21 15:51*	*1*
4-Bromofluorobenzene (Surr)	*70*		*47 - 134*		*03/01/21 15:51*	*1*
Toluene-d8 (Surr)	*82*		*69 - 122*		*03/01/21 15:51*	*1*
Dibromofluoromethane (Surr)	*110*		*78 - 129*		*03/01/21 15:51*	*1*

Lab Sample ID: LCS 240-474892/4
Matrix: Water
Analysis Batch: 474892

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.84		ug/L		98	73 - 129
cis-1,2-Dichloroethene	10.0	9.22		ug/L		92	75 - 124
Tetrachloroethene	10.0	10.9		ug/L		109	70 - 125
trans-1,2-Dichloroethene	10.0	9.78		ug/L		98	74 - 130
Trichloroethene	10.0	9.30		ug/L		93	71 - 121
Vinyl chloride	10.0	9.80		ug/L		98	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 130*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*
Toluene-d8 (Surr)	*89*		*69 - 122*
Dibromofluoromethane (Surr)	*89*		*78 - 129*

Lab Sample ID: 240-144807-G-4 MS
Matrix: Water
Analysis Batch: 474892

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.25		ug/L		93	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	9.38		ug/L		94	68 - 121
Tetrachloroethene	1.0	U	10.0	11.7		ug/L		117	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.98		ug/L		100	69 - 126
Trichloroethene	1.0	U	10.0	9.60		ug/L		96	56 - 124
Vinyl chloride	1.0	U	10.0	10.4		ug/L		104	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*
Toluene-d8 (Surr)	*89*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144807-G-4 MS
Matrix: Water
Analysis Batch: 474892

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*96*		*78 - 129*

Lab Sample ID: 240-144807-H-4 MSD
Matrix: Water
Analysis Batch: 474892

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.00		ug/L		90	64 - 132	3	35
cis-1,2-Dichloroethene	1.0	U	10.0	8.99		ug/L		90	68 - 121	4	35
Tetrachloroethene	1.0	U	10.0	11.0		ug/L		110	52 - 129	6	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.43		ug/L		94	69 - 126	6	35
Trichloroethene	1.0	U	10.0	9.01		ug/L		90	56 - 124	6	35
Vinyl chloride	1.0	U	10.0	10.1		ug/L		101	49 - 136	3	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*
Toluene-d8 (Surr)	*88*		*69 - 122*
Dibromofluoromethane (Surr)	*90*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474842/5
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 12:12	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*		*03/01/21 12:12*	*1*

Lab Sample ID: LCS 240-474842/4
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	9.05		ug/L		91	80 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*70 - 133*

Lab Sample ID: 240-144807-J-4 MS
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	8.95		ug/L		90	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*90*		*70 - 133*

Lab Sample ID: 240-144807-J-4 MSD
Matrix: Water
Analysis Batch: 474842

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.28		ug/L		93	46 - 170	4	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*88*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144806-1

GC/MS VOA

Analysis Batch: 474842

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144806-2	MW-98S_021921	Total/NA	Water	8260B SIM	
240-144806-3	MW-139S_021921	Total/NA	Water	8260B SIM	
MB 240-474842/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474842/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144807-J-4 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144807-J-4 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474892

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144806-1	TRIP BLANK	Total/NA	Water	8260B	
240-144806-2	MW-98S_021921	Total/NA	Water	8260B	
240-144806-3	MW-139S_021921	Total/NA	Water	8260B	
MB 240-474892/7	Method Blank	Total/NA	Water	8260B	
LCS 240-474892/4	Lab Control Sample	Total/NA	Water	8260B	
240-144807-G-4 MS	Matrix Spike	Total/NA	Water	8260B	
240-144807-H-4 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144806-1

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144806-1
Date Collected: 02/19/21 00:00
Matrix: Water
Date Received: 02/24/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474892	03/01/21 23:00	LRW	TAL CAN

Client Sample ID: MW-98S_021921
Lab Sample ID: 240-144806-2
Date Collected: 02/19/21 12:11
Matrix: Water
Date Received: 02/24/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474892	03/01/21 20:13	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474842	03/01/21 13:27	SAM	TAL CAN

Client Sample ID: MW-139S_021921
Lab Sample ID: 240-144806-3
Date Collected: 02/19/21 13:31
Matrix: Water
Date Received: 02/24/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474892	03/01/21 20:37	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474842	03/01/21 13:52	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144806-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

1-21-3

Chain of Custody Record

MICHIGAN TestAmerica 190
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton --- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program:	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	☐ DW ☐ NPDES ☐ RCRA ☐ Other	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	/ of / COCs
Address: 28550 Cabot Drive, Suite 500		Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377		Sampler Name: Gary Schafer	TAT if different from below: 10 day; ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client; Lab sampling
Phone: 248-994-2240		Method of Shipment/Carrier:			Job/SDG No:
Project Name: Ford LTP Off-Site		Shipping/Tracking No:			
Project Number: 30050315.402.04					
PO # 30050315.402.04					

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/19/21									1							X	X	X	X	X	X	X	Trip blank
MW-985-021921		12:11		X						6					N	G	X	X	X	X	X	X	X	Method 8260B Method 8260B Sim
MW-1395-021921		13:31		X						6					N	G	X	X	X	X	X	X	X	1

240-144806 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	02/22/21 9:20	Novi Cold Storage	Arcadis	02/22/21 9:20
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Arcadis	2/23/2021	Amanda Battershell	ETA	2/23/21 10:04
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
Amanda Battershell	ETA	2/23/21 10:47		TA	2-24-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 144806**
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by:

Cooler Received on 2-24-21 Opened on 2-24-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1-2 °C Corrected Cooler Temp. 1-3 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC907861
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page | Samples processed by:

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

March 10, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144806-1
Sample date: 2021-02-19
Report received by CADENA: 2021-03-10
Initial Data Verification completed by CADENA: 2021-03-10
Number of Samples:3
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144806-1

		Sample Name:	TRIP BLANK				MW-98S_021921				MW-139S_021921			
		Lab Sample ID:	2401448061				2401448062				2401448063			
		Sample Date:	2/19/2021				2/19/2021				2/19/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC													
OSW-8260B													
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim													
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

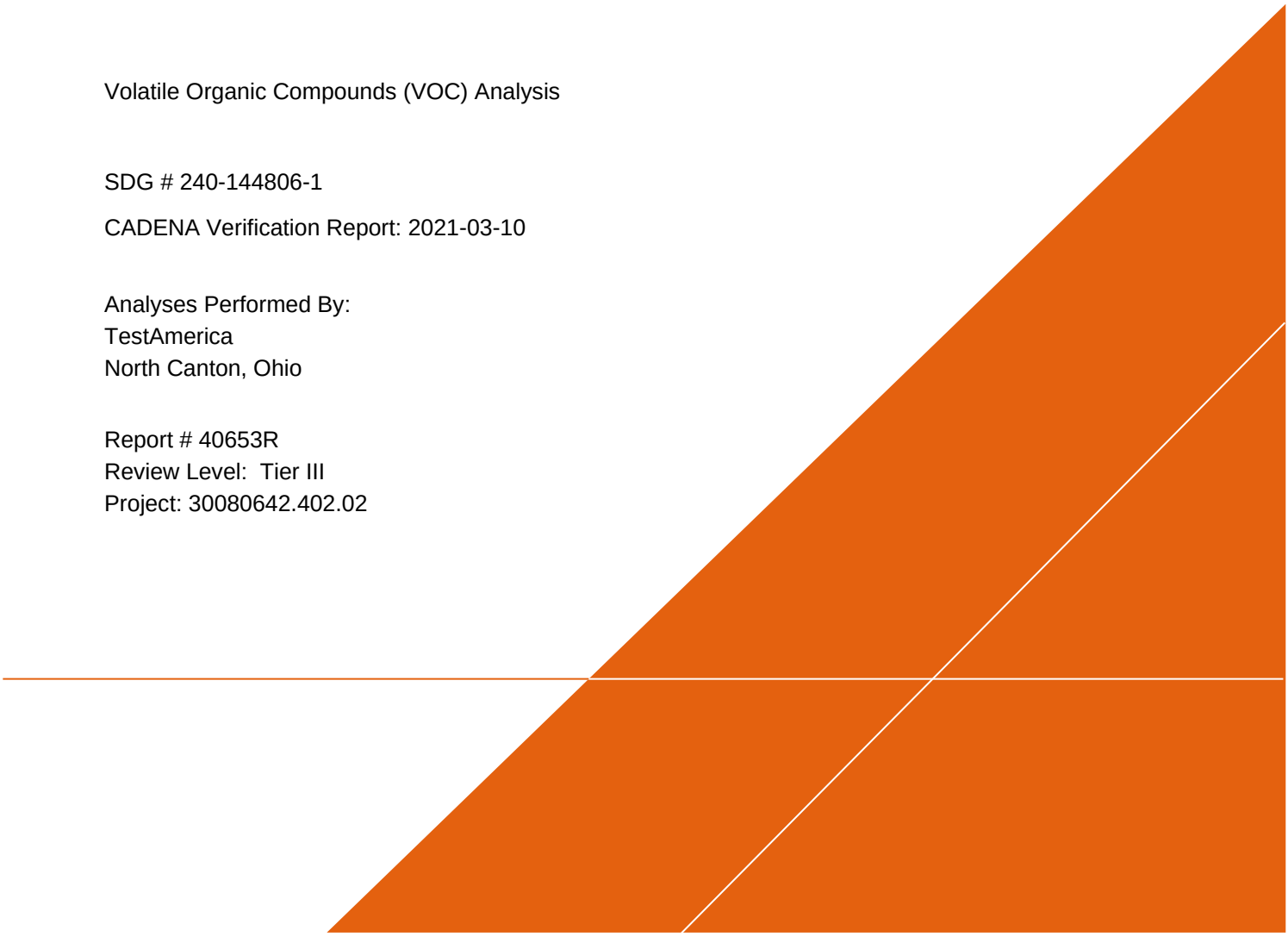
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144806-1

CADENA Verification Report: 2021-03-10

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40653R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144806-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144806-1	Water	02/19/2021		X	
MW-98S_021921	240-144806-2	Water	02/19/2021		X	X
MW-139S_021921	240-144806-3	Water	02/19/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial/Continuing	Compound	Criteria
TRIP BLANK MW-98S_021921 MW-139S_021921	CCV %D	Tetrachloroethene	+21.9%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R

Initial/Continuing	Criteria	Sample Result	Qualification
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1] RRF of 0.01 only applies to compounds which are typically poor responding compounds (i.e., ketones, 1,4-dioxane, etc.)

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

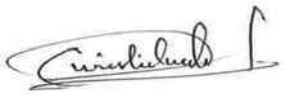
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 22, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 24, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

1-21-3

Chain of Custody Record

MICHIGAN TestAmerica 190

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	/ of / COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Gary Schaefer	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client; Lab sampling
Phone: 248-994-2240	Method of Shipment/Carrier:			Job/SDG No:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/19/21									1							X	X	X	X	X	X	X	Trip blank
MW-98S-021921	1	12:11		X						6					N	G	X	X	X	X	X	X	X	Method 8260B Method 8260B Sim
MW-139S-021921	1	13:31		X						6					N	G	X	X	X	X	X	X	X	1

240-144806 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schaefer	Arcadis	02/22/21 9:20	Novi Cold Storage	Arcadis	02/22/21 9:20
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Arcadis	2/23/2021	Amanda Battershell	ETA	2/23/21 10.04
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
Amanda Battershell	ETA	2/23/21 10.47		TA	2-24-21 800

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03/10/2021

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144806-1

Date Collected: 02/19/21 00:00
Matrix: Water
Date Received: 02/24/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 23:00	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 23:00	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 23:00	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 23:00	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 23:00	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 23:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*116*		*75 - 130*		*03/01/21 23:00*	*1*
4-Bromofluorobenzene (Surr)	*64*		*47 - 134*		*03/01/21 23:00*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*03/01/21 23:00*	*1*
Dibromofluoromethane (Surr)	*110*		*78 - 129*		*03/01/21 23:00*	*1*

Client Sample ID: MW-98S_021921

Lab Sample ID: 240-144806-2

Date Collected: 02/19/21 12:11
Matrix: Water
Date Received: 02/24/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 13:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*70 - 133*		*03/01/21 13:27*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 20:13	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 20:13	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 20:13	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 20:13	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 20:13	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 20:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*75 - 130*		*03/01/21 20:13*	*1*
4-Bromofluorobenzene (Surr)	*67*		*47 - 134*		*03/01/21 20:13*	*1*
Toluene-d8 (Surr)	*84*		*69 - 122*		*03/01/21 20:13*	*1*
Dibromofluoromethane (Surr)	*106*		*78 - 129*		*03/01/21 20:13*	*1*

Client Sample ID: MW-139S_021921

Lab Sample ID: 240-144806-3

Date Collected: 02/19/21 13:31
Matrix: Water
Date Received: 02/24/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/01/21 13:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*70 - 133*		*03/01/21 13:52*	*1*

Client Sample ID: MW-139S_021921
Lab Sample ID: 240-144806-3
Date Collected: 02/19/21 13:31
Matrix: Water
Date Received: 02/24/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 20:37	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 20:37	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 20:37	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 20:37	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 20:37	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 20:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*75 - 130*		*03/01/21 20:37*	*1*
4-Bromofluorobenzene (Surr)	*63*		*47 - 134*		*03/01/21 20:37*	*1*
Toluene-d8 (Surr)	*82*		*69 - 122*		*03/01/21 20:37*	*1*
Dibromofluoromethane (Surr)	*110*		*78 - 129*		*03/01/21 20:37*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144706-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/8/2021 10:51:33 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144706-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144706-1

Job ID: 240-144706-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144706-1

Comments
No additional comments.

Receipt
The samples were received on 2/20/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.7º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144706-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144706-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144706-1	TRIP BLANK	Water	02/18/21 00:00	02/20/21 08:00	
240-144706-2	MW-102_021821	Water	02/18/21 13:00	02/20/21 08:00	
240-144706-3	MW-102S_021821	Water	02/18/21 14:10	02/20/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144706-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144706-1

No Detections.

Client Sample ID: MW-102_021821 — Lab Sample ID: 240-144706-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.90	J	2.0	0.86	ug/L	1		8260B SIM	Total/NA
Vinyl chloride	2.2		1.0	0.20	ug/L	1		8260B	Total/NA

Client Sample ID: MW-102S_021821 — Lab Sample ID: 240-144706-3

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144706-1

Client Sample ID: TRIP BLANK
Date Collected: 02/18/21 00:00
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144706-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 16:27	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 16:27	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 16:27	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 16:27	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 16:27	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 16:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*02/26/21 16:27*	*1*
4-Bromofluorobenzene (Surr)	*67*		*47 - 134*		*02/26/21 16:27*	*1*
Toluene-d8 (Surr)	*82*		*69 - 122*		*02/26/21 16:27*	*1*
Dibromofluoromethane (Surr)	*106*		*78 - 129*		*02/26/21 16:27*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144706-1

Client Sample ID: MW-102_021821
Date Collected: 02/18/21 13:00
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144706-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.90	J	2.0	0.86	ug/L			02/26/21 16:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/26/21 16:15*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 16:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 16:50	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 16:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 16:50	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 16:50	1
Vinyl chloride	2.2		1.0	0.20	ug/L			02/26/21 16:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*75 - 130*		*02/26/21 16:50*	*1*
4-Bromofluorobenzene (Surr)	*68*		*47 - 134*		*02/26/21 16:50*	*1*
Toluene-d8 (Surr)	*82*		*69 - 122*		*02/26/21 16:50*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*02/26/21 16:50*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144706-1

Client Sample ID: MW-102S_021821
Date Collected: 02/18/21 14:10
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144706-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 16:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*		*02/26/21 16:40*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 17:14	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 17:14	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 17:14	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 17:14	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 17:14	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 17:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*75 - 130*		*02/26/21 17:14*	*1*
4-Bromofluorobenzene (Surr)	*69*		*47 - 134*		*02/26/21 17:14*	*1*
Toluene-d8 (Surr)	*81*		*69 - 122*		*02/26/21 17:14*	*1*
Dibromofluoromethane (Surr)	*107*		*78 - 129*		*02/26/21 17:14*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144706-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144706-1	TRIP BLANK	104	67	82	106
240-144706-2	MW-102_021821	105	68	82	103
240-144706-3	MW-102S_021821	110	69	81	107
240-144710-E-5 MS	Matrix Spike	94	91	94	96
240-144710-F-5 MSD	Matrix Spike Duplicate	93	89	87	89
LCS 240-474676/4	Lab Control Sample	87	93	92	89
MB 240-474676/7	Method Blank	104	68	83	102

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144706-2	MW-102_021821	80
240-144706-3	MW-102S_021821	84
240-144712-L-3 MS	Matrix Spike	80
240-144712-L-3 MSD	Matrix Spike Duplicate	81
LCS 240-474632/4	Lab Control Sample	80
MB 240-474632/5	Method Blank	80

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474676/7
Matrix: Water
Analysis Batch: 474676

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 15:39	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 15:39	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 15:39	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 15:39	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 15:39	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 15:39	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*02/26/21 15:39*	*1*
4-Bromofluorobenzene (Surr)	*68*		*47 - 134*		*02/26/21 15:39*	*1*
Toluene-d8 (Surr)	*83*		*69 - 122*		*02/26/21 15:39*	*1*
Dibromofluoromethane (Surr)	*102*		*78 - 129*		*02/26/21 15:39*	*1*

Lab Sample ID: LCS 240-474676/4
Matrix: Water
Analysis Batch: 474676

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.57		ug/L		96	73 - 129
cis-1,2-Dichloroethene	10.0	9.15		ug/L		91	75 - 124
Tetrachloroethene	10.0	12.0		ug/L		120	70 - 125
trans-1,2-Dichloroethene	10.0	10.1		ug/L		101	74 - 130
Trichloroethene	10.0	9.71		ug/L		97	71 - 121
Vinyl chloride	10.0	8.29		ug/L		83	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 130*
4-Bromofluorobenzene (Surr)	*93*		*47 - 134*
Toluene-d8 (Surr)	*92*		*69 - 122*
Dibromofluoromethane (Surr)	*89*		*78 - 129*

Lab Sample ID: 240-144710-E-5 MS
Matrix: Water
Analysis Batch: 474676

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	8.98		ug/L		90	64 - 132
cis-1,2-Dichloroethene	4.2		10.0	13.3		ug/L		91	68 - 121
Tetrachloroethene	1.0	U	10.0	10.6		ug/L		106	52 - 129
trans-1,2-Dichloroethene	0.64	J	10.0	10.4		ug/L		98	69 - 126
Trichloroethene	1.0	U	10.0	9.13		ug/L		91	56 - 124
Vinyl chloride	14		10.0	20.4		ug/L		69	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*94*		*75 - 130*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*
Toluene-d8 (Surr)	*94*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144710-E-5 MS
Matrix: Water
Analysis Batch: 474676

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	96		78 - 129

Lab Sample ID: 240-144710-F-5 MSD
Matrix: Water
Analysis Batch: 474676

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.48		ug/L		95	64 - 132	5	35
cis-1,2-Dichloroethene	4.2		10.0	12.9		ug/L		87	68 - 121	3	35
Tetrachloroethene	1.0	U	10.0	10.9		ug/L		109	52 - 129	2	35
trans-1,2-Dichloroethene	0.64	J	10.0	10.3		ug/L		96	69 - 126	1	35
Trichloroethene	1.0	U	10.0	9.48		ug/L		95	56 - 124	4	35
Vinyl chloride	14		10.0	20.5		ug/L		70	49 - 136	1	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	93		75 - 130
4-Bromofluorobenzene (Surr)	89		47 - 134
Toluene-d8 (Surr)	87		69 - 122
Dibromofluoromethane (Surr)	89		78 - 129

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474632/5
Matrix: Water
Analysis Batch: 474632

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 10:47	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	80		70 - 133		02/26/21 10:47	1

Lab Sample ID: LCS 240-474632/4
Matrix: Water
Analysis Batch: 474632

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.5		ug/L		105	80 - 135

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	80		70 - 133

Lab Sample ID: 240-144712-L-3 MS
Matrix: Water
Analysis Batch: 474632

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	10.2		ug/L		102	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*

Lab Sample ID: 240-144712-L-3 MSD
Matrix: Water
Analysis Batch: 474632

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.2		ug/L		102	46 - 170	0	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144706-1

GC/MS VOA

Analysis Batch: 474632

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144706-2	MW-102_021821	Total/NA	Water	8260B SIM	
240-144706-3	MW-102S_021821	Total/NA	Water	8260B SIM	
MB 240-474632/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474632/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144712-L-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144712-L-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474676

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144706-1	TRIP BLANK	Total/NA	Water	8260B	
240-144706-2	MW-102_021821	Total/NA	Water	8260B	
240-144706-3	MW-102S_021821	Total/NA	Water	8260B	
MB 240-474676/7	Method Blank	Total/NA	Water	8260B	
LCS 240-474676/4	Lab Control Sample	Total/NA	Water	8260B	
240-144710-E-5 MS	Matrix Spike	Total/NA	Water	8260B	
240-144710-F-5 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144706-1

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144706-1
Date Collected: 02/18/21 00:00
Matrix: Water
Date Received: 02/20/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474676	02/26/21 16:27	LRW	TAL CAN

Client Sample ID: MW-102_021821
Lab Sample ID: 240-144706-2
Date Collected: 02/18/21 13:00
Matrix: Water
Date Received: 02/20/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474676	02/26/21 16:50	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474632	02/26/21 16:15	SAM	TAL CAN

Client Sample ID: MW-102S_021821
Lab Sample ID: 240-144706-3
Date Collected: 02/18/21 14:10
Matrix: Water
Date Received: 02/20/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474676	02/26/21 17:14	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474632	02/26/21 16:40	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144706-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

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TestAmerica Laboratories, Inc.

Regulatory program: DW NPDES RCRA Other

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day (3 weeks, 2 weeks, 1 week, 2 days, 1 day)		Walk-in client: Lab sampling:
Phone: 248-994-2240	Method of Shipment/Carrier:			Job/SDG No:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAcr/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-102_021821	2/18/21	1300		6						6					N	G	X	X	X	X	X	X	X	3 vocs for 8260B 3 vocs for 8260B SIM
MW-102S_021821	2/18/21	1410		6						6					N	G	X	X	X	X	X	X	X	

240-144706 Chain of Custody

Possible Hazard Identification: Non-Hazard, Flammable, Skin Irritant, Poison B, Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client, Disposal By Lab, Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: Elizabeth Spoon	Arcadis	2/18/21	1600	Received by: Novi Cold Storage	Arcadis 2/18/21 1600
Relinquished by: Kristoffer Hinskey	Arcadis	2/19/21	1011	Received by: Amanda Battershell	ETA 2/19/21 1011
Relinquished by: Amanda Battershell	ETA	2/19/21	1455	Received in Laboratory by:	Company: TA Date/Time: 2-20-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 144706**
Canton Facility

Client Arcadis Site Name

Cooler unpacked by:

Cooler Received on 2-20-21 Opened on 2-20-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.4 °C Corrected Cooler Temp. 1.7 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC907861
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #	Yes	No
17. Was a LL Hg or Me Hg trip blank present?	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container.
Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.
Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

DATA VERIFICATION REPORT



March 08, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144706-1
Sample date: 2021-02-18
Report received by CADENA: 2021-03-08
Initial Data Verification completed by CADENA: 2021-03-08
Number of Samples:3
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144706-1

		Sample Name:	TRIP BLANK				MW-102_021821				MW-102S_021821			
		Lab Sample ID:	2401447061				2401447062				2401447063			
		Sample Date:	2/18/2021				2/18/2021				2/18/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC													
OSW-8260B													
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	2.2	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim													
1,4-Dioxane	123-91-1					0.90	2.0	ug/l	J	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

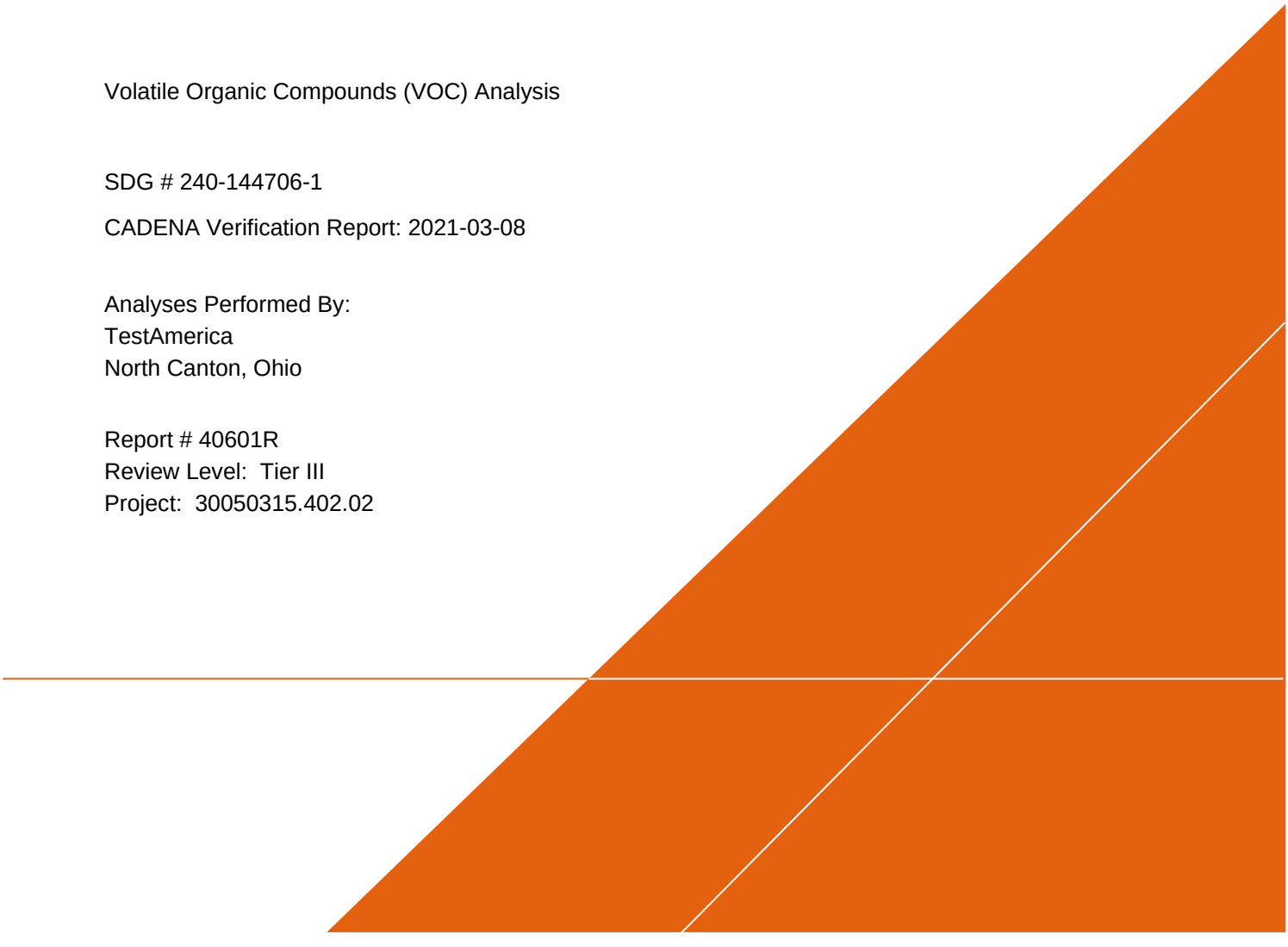
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144706-1

CADENA Verification Report: 2021-03-08

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40601R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144706-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144706-1	Water	02/18/2021		X	
MW-102_021821	240-144706-2	Water	02/18/2021		X	X
MW-102S_021821	240-144706-3	Water	02/18/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

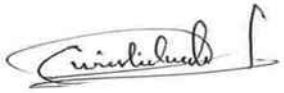
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 18, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 18, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN T90

TestAmerica

TestAmerica Laboratories, Inc.

Regulatory program: DW NPDES RCRA Other

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Acet / NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-102_021821	2/18/21	1300		6						6					N	G	X	X	X	X	X	X	X	3 vocs for 8260B 3 vocs for 8260B SIM
MW-102S_021821	2/18/21	1410		6						6					N	G	X	X	X	X	X	X	X	

240-144706 Chain of Custody

Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Emma Witherspoon	Arcadis	2/18/21 1600	Novi Cold Storage	Arcadis	2/18/21 1800
Kristoffer Hinskey	Arcadis	2/19/21 1011	Amanda Battershell	ETA	2/19/21 1011
Amanda Battershell	ETA	2/19/21 1455	Received in Laboratory by:	Company: TA	Date/Time: 2-20-21 800

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Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144706-1

Date Collected: 02/18/21 00:00
Matrix: Water
Date Received: 02/20/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 16:27	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 16:27	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 16:27	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 16:27	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 16:27	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 16:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*02/26/21 16:27*	*1*
4-Bromofluorobenzene (Surr)	*67*		*47 - 134*		*02/26/21 16:27*	*1*
Toluene-d8 (Surr)	*82*		*69 - 122*		*02/26/21 16:27*	*1*
Dibromofluoromethane (Surr)	*106*		*78 - 129*		*02/26/21 16:27*	*1*

Client Sample ID: MW-102_021821

Lab Sample ID: 240-144706-2

Date Collected: 02/18/21 13:00
Matrix: Water
Date Received: 02/20/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**0.90**	**J**	2.0	0.86	ug/L			02/26/21 16:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/26/21 16:15*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 16:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 16:50	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 16:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 16:50	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 16:50	1
Vinyl chloride	**2.2**		1.0	0.20	ug/L			02/26/21 16:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*75 - 130*		*02/26/21 16:50*	*1*
4-Bromofluorobenzene (Surr)	*68*		*47 - 134*		*02/26/21 16:50*	*1*
Toluene-d8 (Surr)	*82*		*69 - 122*		*02/26/21 16:50*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*02/26/21 16:50*	*1*

Client Sample ID: MW-102S_021821

Lab Sample ID: 240-144706-3

Date Collected: 02/18/21 14:10
Matrix: Water
Date Received: 02/20/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 16:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*		*02/26/21 16:40*	*1*

Client Sample ID: MW-102S_021821
Lab Sample ID: 240-144706-3
Date Collected: 02/18/21 14:10
Matrix: Water
Date Received: 02/20/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 17:14	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 17:14	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 17:14	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 17:14	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 17:14	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 17:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*75 - 130*		*02/26/21 17:14*	*1*
4-Bromofluorobenzene (Surr)	*69*		*47 - 134*		*02/26/21 17:14*	*1*
Toluene-d8 (Surr)	*81*		*69 - 122*		*02/26/21 17:14*	*1*
Dibromofluoromethane (Surr)	*107*		*78 - 129*		*02/26/21 17:14*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-145228-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/24/2021 2:47:19 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145228-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-145228-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-145228-1

Comments
No additional comments.

Receipt
The samples were received on 3/3/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.6º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145228-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145228-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-145228-1	TRIP BLANK	Water	03/01/21 00:00	03/03/21 08:00	
240-145228-2	MW-105S_030121	Water	03/01/21 16:12	03/03/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145228-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-145228-1

No Detections.

Client Sample ID: MW-105S_030121 — Lab Sample ID: 240-145228-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145228-1

Client Sample ID: TRIP BLANK
Date Collected: 03/01/21 00:00
Date Received: 03/03/21 08:00

Lab Sample ID: 240-145228-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/05/21 14:27	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/05/21 14:27	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/05/21 14:27	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/05/21 14:27	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/05/21 14:27	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/05/21 14:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*		*03/05/21 14:27*	*1*
4-Bromofluorobenzene (Surr)	*81*		*47 - 134*		*03/05/21 14:27*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*03/05/21 14:27*	*1*
Dibromofluoromethane (Surr)	*89*		*78 - 129*		*03/05/21 14:27*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145228-1

Client Sample ID: MW-105S_030121
Date Collected: 03/01/21 16:12
Date Received: 03/03/21 08:00

Lab Sample ID: 240-145228-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/04/21 21:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*70 - 133*		*03/04/21 21:03*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/05/21 14:49	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/05/21 14:49	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/05/21 14:49	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/05/21 14:49	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/05/21 14:49	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/05/21 14:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*75 - 130*		*03/05/21 14:49*	*1*
4-Bromofluorobenzene (Surr)	*76*		*47 - 134*		*03/05/21 14:49*	*1*
Toluene-d8 (Surr)	*87*		*69 - 122*		*03/05/21 14:49*	*1*
Dibromofluoromethane (Surr)	*83*		*78 - 129*		*03/05/21 14:49*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145228-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-145228-1	TRIP BLANK	92	81	90	89
240-145228-2	MW-105S_030121	85	76	87	83
240-145297-B-13 MS	Matrix Spike	92	87	98	92
240-145297-B-13 MSD	Matrix Spike Duplicate	98	90	99	99
LCS 240-475616/4	Lab Control Sample	88	82	90	89
MB 240-475616/6	Method Blank	97	87	99	94

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-145164-J-2 MS	Matrix Spike	94
240-145164-J-2 MSD	Matrix Spike Duplicate	96
240-145228-2	MW-105S_030121	99
LCS 240-475458/4	Lab Control Sample	84
MB 240-475458/5	Method Blank	87

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475616/6
Matrix: Water
Analysis Batch: 475616

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/05/21 12:14	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/05/21 12:14	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/05/21 12:14	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/05/21 12:14	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/05/21 12:14	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/05/21 12:14	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*		*03/05/21 12:14*	*1*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*		*03/05/21 12:14*	*1*
Toluene-d8 (Surr)	*99*		*69 - 122*		*03/05/21 12:14*	*1*
Dibromofluoromethane (Surr)	*94*		*78 - 129*		*03/05/21 12:14*	*1*

Lab Sample ID: LCS 240-475616/4
Matrix: Water
Analysis Batch: 475616

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.93		ug/L		89	73 - 129
cis-1,2-Dichloroethene	10.0	9.26		ug/L		93	75 - 124
Tetrachloroethene	10.0	9.68		ug/L		97	70 - 125
trans-1,2-Dichloroethene	10.0	8.93		ug/L		89	74 - 130
Trichloroethene	10.0	9.56		ug/L		96	71 - 121
Vinyl chloride	10.0	8.43		ug/L		84	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 130*
4-Bromofluorobenzene (Surr)	*82*		*47 - 134*
Toluene-d8 (Surr)	*90*		*69 - 122*
Dibromofluoromethane (Surr)	*89*		*78 - 129*

Lab Sample ID: 240-145297-B-13 MS
Matrix: Water
Analysis Batch: 475616

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	370		1000	1070		ug/L		70	64 - 132
cis-1,2-Dichloroethene	42	J	1000	939		ug/L		90	68 - 121
Tetrachloroethene	100	U	1000	880		ug/L		88	52 - 129
trans-1,2-Dichloroethene	100	U	1000	859		ug/L		86	69 - 126
Trichloroethene	100	U	1000	893		ug/L		89	56 - 124
Vinyl chloride	100	U	1000	684		ug/L		68	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*
Toluene-d8 (Surr)	*98*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-145297-B-13 MS
Matrix: Water
Analysis Batch: 475616

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*92*		*78 - 129*

Lab Sample ID: 240-145297-B-13 MSD
Matrix: Water
Analysis Batch: 475616

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	370		1000	1160		ug/L		79	64 - 132	8	35
cis-1,2-Dichloroethene	42	J	1000	910		ug/L		87	68 - 121	3	35
Tetrachloroethene	100	U	1000	932		ug/L		93	52 - 129	6	35
trans-1,2-Dichloroethene	100	U	1000	832		ug/L		83	69 - 126	3	35
Trichloroethene	100	U	1000	881		ug/L		88	56 - 124	1	35
Vinyl chloride	100	U	1000	830		ug/L		83	49 - 136	19	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 130*
4-Bromofluorobenzene (Surr)	*90*		*47 - 134*
Toluene-d8 (Surr)	*99*		*69 - 122*
Dibromofluoromethane (Surr)	*99*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475458/5
Matrix: Water
Analysis Batch: 475458

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/04/21 11:50	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*70 - 133*		*03/04/21 11:50*	*1*

Lab Sample ID: LCS 240-475458/4
Matrix: Water
Analysis Batch: 475458

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	8.91		ug/L		89	80 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*

Lab Sample ID: 240-145164-J-2 MS
Matrix: Water
Analysis Batch: 475458

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	8.58		ug/L		86	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 133*

Lab Sample ID: 240-145164-J-2 MSD
Matrix: Water
Analysis Batch: 475458

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	8.65		ug/L		86	46 - 170	1	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*96*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145228-1

GC/MS VOA

Analysis Batch: 475458

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-145228-2	MW-105S_030121	Total/NA	Water	8260B SIM	
MB 240-475458/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-475458/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-145164-J-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-145164-J-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 475616

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-145228-1	TRIP BLANK	Total/NA	Water	8260B	
240-145228-2	MW-105S_030121	Total/NA	Water	8260B	
MB 240-475616/6	Method Blank	Total/NA	Water	8260B	
LCS 240-475616/4	Lab Control Sample	Total/NA	Water	8260B	
240-145297-B-13 MS	Matrix Spike	Total/NA	Water	8260B	
240-145297-B-13 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145228-1

Client Sample ID: TRIP BLANK
Date Collected: 03/01/21 00:00
Date Received: 03/03/21 08:00

Lab Sample ID: 240-145228-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475616	03/05/21 14:27	LEE	TAL CAN

Client Sample ID: MW-105S_030121
Date Collected: 03/01/21 16:12
Date Received: 03/03/21 08:00

Lab Sample ID: 240-145228-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475616	03/05/21 14:49	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	475458	03/04/21 21:03	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145228-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

MICHIGAN 190 TestAmerica — THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No: ___ of ___ COCs
Phone: 248-994-2240	Sampler Name: Allyson Hartz	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day	For lab use only: Walk-in client; Lab sampling; Job/SDG No:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:	10 day	
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	trip blank
MW-105S_030121	3/1/21	16:12		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B; 3 VOAs for 8260B SIM

240-145228 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Allyson Hartz	Arcadis	3/1/21 17:30	Novi cold storage	Arcadis	3/1/21 17:30
Relinquished by: RACHEL BIELAK	Company: ARCADIS	Date/Time: 3/2/21 10:00	Received by: Amanda Battershell	Company: ETA	Date/Time: 3/2/21 10:01
Relinquished by: Amanda Battershell	Company: ETA	Date/Time: 3/2/21 1052	Received in Laboratory by:	Company: ETA	Date/Time: 3-3-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 145228
Canton Facility

Client Arcadis Site Name

Cooler unpacked by: Matt Snyder

Cooler Received on 3-3-21 Opened on 3-3-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TB Foam Box Client Cooler Box Other

Packing material used: ~~Bubble~~ Wrap Foam Plastic Bag None Other

COOLANT: ~~Wet Ice~~ Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2.5 °C Corrected Cooler Temp. 2.6 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes) No	**Tests that are not checked for pH by Receiving:**
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes) No NA	
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes (No)	**VOAs**
-Were tamper/custody seals intact and uncompromised?	(Yes) No NA	**Oil and Grease**
3. Shippers' packing slip attached to the cooler(s)?	(Yes) No	**TOC**
4. Did custody papers accompany the sample(s)?	(Yes) No	
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes) No	
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes) No	
7. Did all bottles arrive in good condition (Unbroken)?	(Yes) No	
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes) No	
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes) No	
11. Sufficient quantity received to perform indicated analyses?	(Yes) No	
12. Are these work share samples and all listed on the COC?	Yes (No)	
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No (NA)	pH Strip Lot# **HC022887**
14. Were VOAs on the COC?	(Yes) No	
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes (No) NA	
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 021280IF	(Yes) No	
17. Was a LL Hg or Me Hg trip blank present? ____	Yes (No)	

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

WI-NC-099

DATA VERIFICATION REPORT

March 24, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 145228-1
Sample date: 2021-03-01
Report received by CADENA: 2021-03-24
Initial Data Verification completed by CADENA: 2021-03-24
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 145228-1

		Sample Name:	TRIP BLANK				MW-105S_030121			
		Lab Sample ID:	2401452281				2401452282			
		Sample Date:	3/1/2021				3/1/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

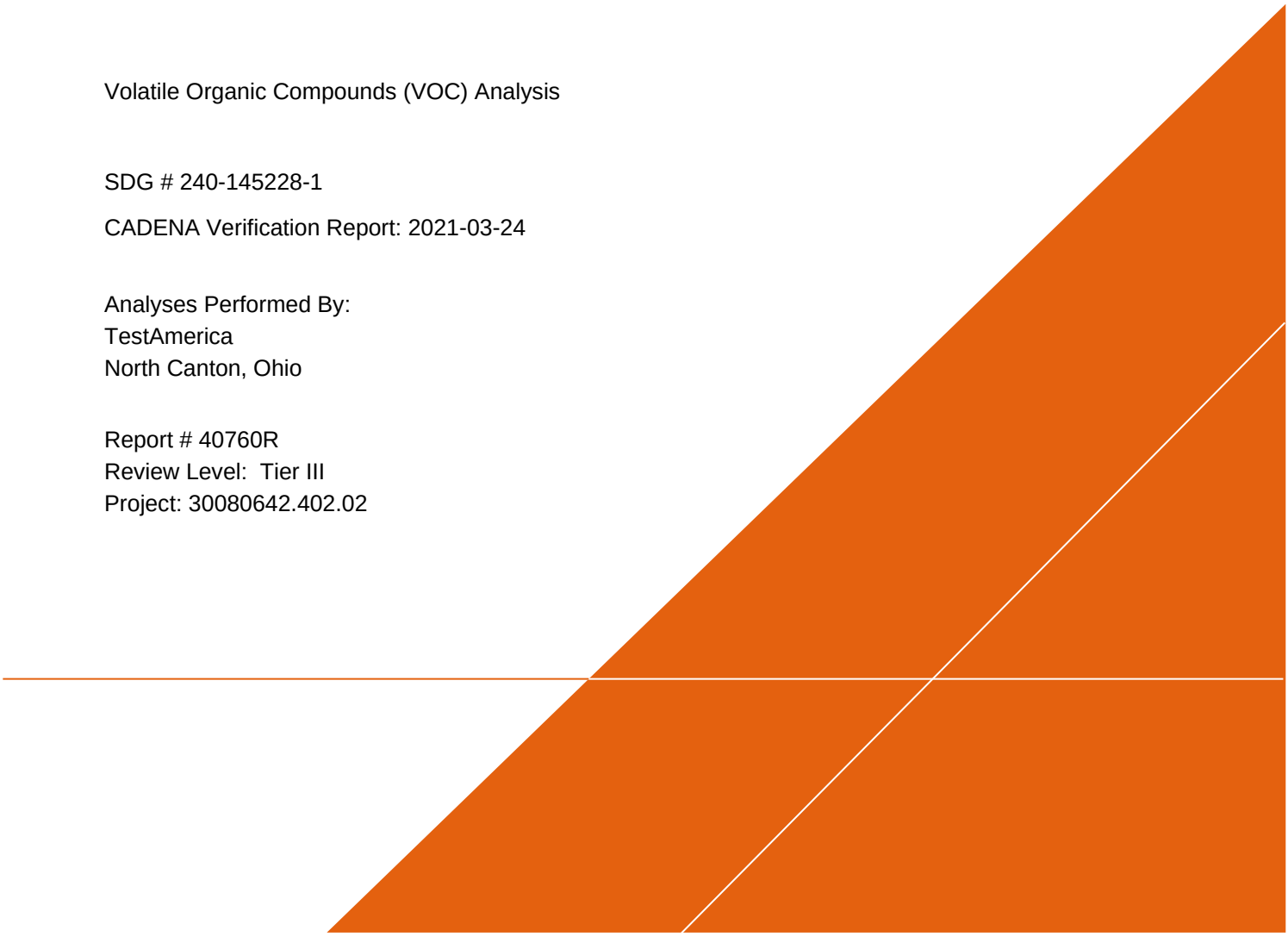
Volatile Organic Compounds (VOC) Analysis

SDG # 240-145228-1

CADENA Verification Report: 2021-03-24

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40760R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-145228-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-145228-1	Water	03/01/2021		X	
MW-105S_030121	240-145228-2	Water	03/01/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

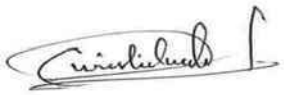
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 27, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 29, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN TestAmerica 190
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		
Phone: 248-994-2240	Sampler Name: Allyson Hartz	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		For lab use only: Walk-in client; Lab sampling; Job/SDG No:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:	10 day		
Project Number: 30050315.402.04	Shipping/Tracking No:			
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	trip blank
MW-1055_030121	3/1/21	16:12		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-145228 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Allyson Hartz	Arcadis	3/1/21 17:30	Novi cold storage	Arcadis	3/1/21 17:30
Relinquished by: RACHEL BIELAK	Company: ARCADIS	Date/Time: 3/2/21	10:00 Received by: Amanda Battershell	Company: ETA	Date/Time: 3/2/21 10:01
Relinquished by: Amanda Battershell	Company: ETA	Date/Time: 3/2/21	10:52 Received in Laboratory by:	Company: ETA	Date/Time: 3-3-21 800

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-145228-1
Date Collected: 03/01/21 00:00
Matrix: Water
Date Received: 03/03/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/05/21 14:27	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/05/21 14:27	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/05/21 14:27	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/05/21 14:27	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/05/21 14:27	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/05/21 14:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*		*03/05/21 14:27*	*1*
4-Bromofluorobenzene (Surr)	*81*		*47 - 134*		*03/05/21 14:27*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*03/05/21 14:27*	*1*
Dibromofluoromethane (Surr)	*89*		*78 - 129*		*03/05/21 14:27*	*1*

Client Sample ID: MW-105S_030121
Lab Sample ID: 240-145228-2
Date Collected: 03/01/21 16:12
Matrix: Water
Date Received: 03/03/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/04/21 21:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*70 - 133*		*03/04/21 21:03*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/05/21 14:49	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/05/21 14:49	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/05/21 14:49	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/05/21 14:49	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/05/21 14:49	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/05/21 14:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*85*		*75 - 130*		*03/05/21 14:49*	*1*
4-Bromofluorobenzene (Surr)	*76*		*47 - 134*		*03/05/21 14:49*	*1*
Toluene-d8 (Surr)	*87*		*69 - 122*		*03/05/21 14:49*	*1*
Dibromofluoromethane (Surr)	*83*		*78 - 129*		*03/05/21 14:49*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144516-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
2/24/2021 11:49:30 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
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Have a Question? Ask The Expert
Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144516-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
S1+	Surrogate recovery exceeds control limits, high biased.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144516-1

Job ID: 240-144516-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144516-1

Comments
No additional comments.

Receipt
The samples were received on 2/13/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.6º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144516-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144516-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144516-1	TRIP BLANK	Water	02/11/21 00:00	02/13/21 08:00	
240-144516-2	MW-106S_021121	Water	02/11/21 10:20	02/13/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144516-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144516-1

No Detections.

Client Sample ID: MW-106S_021121 — Lab Sample ID: 240-144516-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144516-1

Client Sample ID: TRIP BLANK
Date Collected: 02/11/21 00:00
Date Received: 02/13/21 08:00

Lab Sample ID: 240-144516-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 17:48	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 17:48	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 17:48	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 17:48	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 17:48	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/22/21 17:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*75 - 130*		*02/22/21 17:48*	*1*
4-Bromofluorobenzene (Surr)	*106*		*47 - 134*		*02/22/21 17:48*	*1*
Toluene-d8 (Surr)	*101*		*69 - 122*		*02/22/21 17:48*	*1*
Dibromofluoromethane (Surr)	*89*		*78 - 129*		*02/22/21 17:48*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144516-1

Client Sample ID: MW-106S_021121
Date Collected: 02/11/21 10:20
Date Received: 02/13/21 08:00

Lab Sample ID: 240-144516-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/19/21 19:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*		*02/19/21 19:35*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 18:10	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 18:10	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 18:10	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 18:10	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 18:10	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/22/21 18:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*75 - 130*		*02/22/21 18:10*	*1*
4-Bromofluorobenzene (Surr)	*114*		*47 - 134*		*02/22/21 18:10*	*1*
Toluene-d8 (Surr)	*109*		*69 - 122*		*02/22/21 18:10*	*1*
Dibromofluoromethane (Surr)	*100*		*78 - 129*		*02/22/21 18:10*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144516-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144516-1	TRIP BLANK	99	106	101	89
240-144516-2	MW-106S_021121	108	114	109	100
240-144516-2 MS	MW-106S-MS_021121	119	134	126 S1+	117
240-144516-2 MSD	MW-106S-MSD_021121	99	113	102	94
LCS 240-473923/5	Lab Control Sample	105	118	109	99
MB 240-473923/8	Method Blank	103	112	106	95

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144516-2	MW-106S_021121	79
240-144516-2 MS	MW-106S-MS_021121	78
240-144516-2 MSD	MW-106S-MSD_021121	81
LCS 240-473720/4	Lab Control Sample	82
MB 240-473720/5	Method Blank	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473923/8
Matrix: Water
Analysis Batch: 473923

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 11:12	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 11:12	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 11:12	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 11:12	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 11:12	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/22/21 11:12	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*75 - 130*		*02/22/21 11:12*	*1*
4-Bromofluorobenzene (Surr)	*112*		*47 - 134*		*02/22/21 11:12*	*1*
Toluene-d8 (Surr)	*106*		*69 - 122*		*02/22/21 11:12*	*1*
Dibromofluoromethane (Surr)	*95*		*78 - 129*		*02/22/21 11:12*	*1*

Lab Sample ID: LCS 240-473923/5
Matrix: Water
Analysis Batch: 473923

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	20.0	18.8		ug/L		94	73 - 129
cis-1,2-Dichloroethene	20.0	17.6		ug/L		88	75 - 124
Tetrachloroethene	20.0	19.8		ug/L		99	70 - 125
trans-1,2-Dichloroethene	20.0	18.6		ug/L		93	74 - 130
Trichloroethene	20.0	18.8		ug/L		94	71 - 121
Vinyl chloride	20.0	19.9		ug/L		99	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*105*		*75 - 130*
4-Bromofluorobenzene (Surr)	*118*		*47 - 134*
Toluene-d8 (Surr)	*109*		*69 - 122*
Dibromofluoromethane (Surr)	*99*		*78 - 129*

Lab Sample ID: 240-144516-2 MS
Matrix: Water
Analysis Batch: 473923

Client Sample ID: MW-106S-MS_021121
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	20.0	23.1		ug/L		115	64 - 132
cis-1,2-Dichloroethene	1.0	U	20.0	21.5		ug/L		107	68 - 121
Tetrachloroethene	1.0	U	20.0	24.7		ug/L		123	52 - 129
trans-1,2-Dichloroethene	1.0	U	20.0	22.6		ug/L		113	69 - 126
Trichloroethene	1.0	U	20.0	22.8		ug/L		114	56 - 124
Vinyl chloride	1.0	U	20.0	21.8		ug/L		109	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*119*		*75 - 130*
4-Bromofluorobenzene (Surr)	*134*		*47 - 134*
Toluene-d8 (Surr)	*126*	*S1+*	*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144516-2 MS
Matrix: Water
Analysis Batch: 473923

Client Sample ID: MW-106S-MS_021121
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*117*		*78 - 129*

Lab Sample ID: 240-144516-2 MSD
Matrix: Water
Analysis Batch: 473923

Client Sample ID: MW-106S-MSD_021121
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	20.0	18.9		ug/L		94	64 - 132	20	35
cis-1,2-Dichloroethene	1.0	U	20.0	17.4		ug/L		87	68 - 121	21	35
Tetrachloroethene	1.0	U	20.0	19.4		ug/L		97	52 - 129	24	35
trans-1,2-Dichloroethene	1.0	U	20.0	18.1		ug/L		91	69 - 126	22	35
Trichloroethene	1.0	U	20.0	18.8		ug/L		94	56 - 124	19	35
Vinyl chloride	1.0	U	20.0	18.7		ug/L		94	49 - 136	15	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*99*		*75 - 130*
4-Bromofluorobenzene (Surr)	*113*		*47 - 134*
Toluene-d8 (Surr)	*102*		*69 - 122*
Dibromofluoromethane (Surr)	*94*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473720/5
Matrix: Water
Analysis Batch: 473720

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/19/21 11:08	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/19/21 11:08*	*1*

Lab Sample ID: LCS 240-473720/4
Matrix: Water
Analysis Batch: 473720

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	9.95		ug/L		100	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144516-2 MS
Matrix: Water
Analysis Batch: 473720

Client Sample ID: MW-106S-MS_021121
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	10.6		ug/L		106	46 - 170		

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*78*		*70 - 133*

Lab Sample ID: 240-144516-2 MSD
Matrix: Water
Analysis Batch: 473720

Client Sample ID: MW-106S-MSD_021121
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.3		ug/L		103	46 - 170	3	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144516-1

GC/MS VOA

Analysis Batch: 473720

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144516-2	MW-106S_021121	Total/NA	Water	8260B SIM	
MB 240-473720/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-473720/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144516-2 MS	MW-106S-MS_021121	Total/NA	Water	8260B SIM	
240-144516-2 MSD	MW-106S-MSD_021121	Total/NA	Water	8260B SIM	

Analysis Batch: 473923

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144516-1	TRIP BLANK	Total/NA	Water	8260B	
240-144516-2	MW-106S_021121	Total/NA	Water	8260B	
MB 240-473923/8	Method Blank	Total/NA	Water	8260B	
LCS 240-473923/5	Lab Control Sample	Total/NA	Water	8260B	
240-144516-2 MS	MW-106S-MS_021121	Total/NA	Water	8260B	
240-144516-2 MSD	MW-106S-MSD_021121	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144516-1

Client Sample ID: TRIP BLANK
Date Collected: 02/11/21 00:00
Date Received: 02/13/21 08:00

Lab Sample ID: 240-144516-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473923	02/22/21 17:48	HMB	TAL CAN

Client Sample ID: MW-106S_021121
Date Collected: 02/11/21 10:20
Date Received: 02/13/21 08:00

Lab Sample ID: 240-144516-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473923	02/22/21 18:10	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		1	473720	02/19/21 19:35	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144516-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 | 810-229-2763

MICHIGAN 190

Client Contact	Regulatory program: DW NPDES RCRA Other			TestAmerica Laboratories, Inc.
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; 3 weeks; 2 weeks; 1 week; 2 days; 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-106S_021121	2/11/21	1020		6						6					N	G	X	X	X	X	X	X	X	3 vocs for 8260B; 3 vocs for 8260B SIM
MW-106S-MS_021121	2/11/21	1020		6						6					N	G	X	X	X	X	X	X	X	Run MS/MSD
MW-106S-MSD_021121	2/11/21	1020		6						6					N	G	X	X	X	X	X	X	X	Run MS/MSD

240-144516 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; ✓ Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
E Witherspoon	Arcadis	2/11/21 1700	NM Cdy Storage	Arcadis	2/11/21 1700
Julia McClafferty	Arcadis	2/12/2021	Amanda Battershell	ETA	2/12/21 10:05
Amanda Battershell	ETA	2/12/21 11:01	Received in Laboratory by: [signature]	ETA	2-13-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 144516

Client Arcadis Site Name

Cooler unpacked by: Ryan C

Cooler Received on 2-13-21 Opened on 2-13-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.5 °C Corrected Cooler Temp. 1.6 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)? (Yes) No
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 59072 (Yes) No
17. Was a LL Hg or Me Hg trip blank present? Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container.
Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.
Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

DATA VERIFICATION REPORT



February 24, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144516-1
Sample date: 2021-02-11
Report received by CADENA: 2021-02-24
Initial Data Verification completed by CADENA: 2021-02-24
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC sample -002MS surrogate recovery outliers did not result in qualification of client sample data.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, MS/MSD Recovery, MS/MSD RPD, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144516-1

		Sample Name:	TRIP BLANK				MW-106S_021121			
		Lab Sample ID:	2401445161				2401445162			
		Sample Date:	2/11/2021				2/11/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

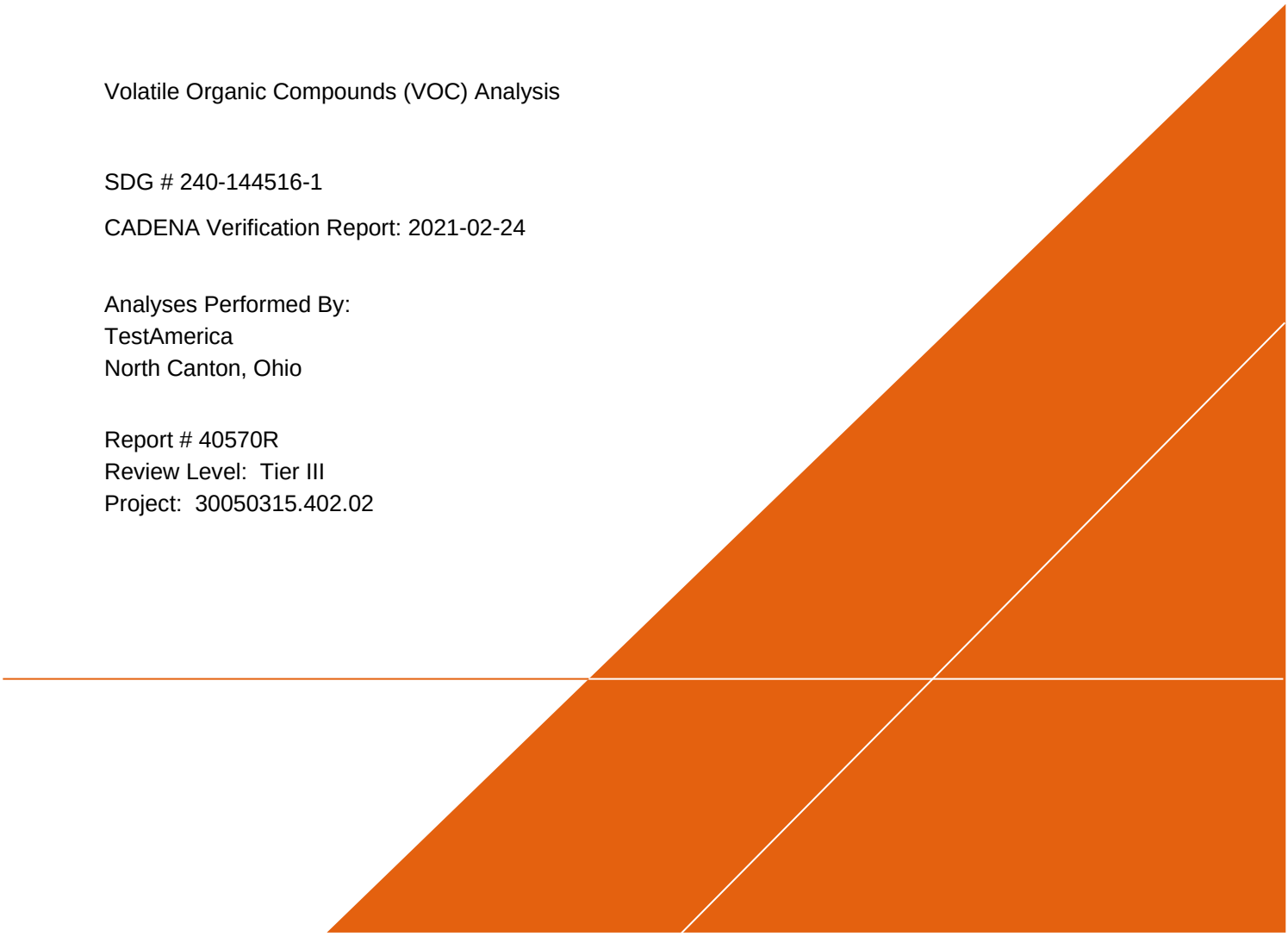
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144516-1

CADENA Verification Report: 2021-02-24

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40570R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144516-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144516-1	Water	02/11/2021		X	
MW-106S_021121	240-144516-2	Water	02/11/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

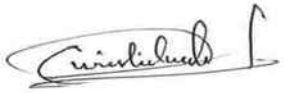
%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 17, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 | 810-229-2763

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TestAmerica Laboratories, Inc.

Client Contact	Regulatory program: DW NPDES RCRA Other		
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com		
Phone: 248-994-2240	Sampler Name: Emma Witherspoon		
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

COC No:

1 of 1 COCs

For lab use only

Walk-in client

Lab sampling

Job/SDG No:

Analysis Turnaround Time

TAT if different from below

10 day: 3 weeks / ✓ 2 weeks / 1 week / 2 days / 1 day

Analyses

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-106S_021121	2/11/21	1020		6						6					N	G	X	X	X	X	X	X	X	3 VOCs for 8260B 3 VOCs for 8260B SIM
MW-106S-MS_021121	2/11/21	1020		6						6					N	G	X	X	X	X	X	X	X	Run MS/MSD
MW-106S-MSD_021121	2/11/21	1020		6						6					N	G	X	X	X	X	X	X	X	Run MS/MSD

240-144516 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / ✓ Disposal By Lab / Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
E Witherspoon	Arcadis	2/11/21 1700	NSI cdg storage	Arcadis	2/11/21 1700
Julia McClafferty	Arcadis	2/12/2021	Amanda Battershell	ETA	2/12/21 10:05
Amanda Battershell	ETA	2/12/21 11:01	Received in Laboratory by: [signature]	ETA	2-13-21 800

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02/24/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144516-1
Date Collected: 02/11/21 00:00
Matrix: Water
Date Received: 02/13/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 17:48	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 17:48	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 17:48	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 17:48	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 17:48	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/22/21 17:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*75 - 130*		*02/22/21 17:48*	*1*
4-Bromofluorobenzene (Surr)	*106*		*47 - 134*		*02/22/21 17:48*	*1*
Toluene-d8 (Surr)	*101*		*69 - 122*		*02/22/21 17:48*	*1*
Dibromofluoromethane (Surr)	*89*		*78 - 129*		*02/22/21 17:48*	*1*

Client Sample ID: MW-106S_021121
Lab Sample ID: 240-144516-2
Date Collected: 02/11/21 10:20
Matrix: Water
Date Received: 02/13/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/19/21 19:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*		*02/19/21 19:35*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 18:10	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 18:10	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 18:10	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 18:10	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 18:10	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/22/21 18:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*75 - 130*		*02/22/21 18:10*	*1*
4-Bromofluorobenzene (Surr)	*114*		*47 - 134*		*02/22/21 18:10*	*1*
Toluene-d8 (Surr)	*109*		*69 - 122*		*02/22/21 18:10*	*1*
Dibromofluoromethane (Surr)	*100*		*78 - 129*		*02/22/21 18:10*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144564-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/3/2021 10:11:20 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144564-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
S1-	Surrogate recovery exceeds control limits, low biased.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144564-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144564-1

Comments
No additional comments.

Receipt
The samples were received on 2/17/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.5º C.

GC/MS VOA
Method 8260B: The laboratory control sample (LCS) for analytical batch 240-474305 recovered outside control limits for the following analyte: Tetrachloroethane. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data has been reported: TRIP BLANK (240-144564-1) and (LCS 240-474305/4).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144564-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144564-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144564-1	TRIP BLANK	Water	02/15/21 00:00	02/17/21 08:00	
240-144564-2	MW-136S_021521	Water	02/15/21 10:50	02/17/21 08:00	
240-144564-3	MW-107S_021521	Water	02/15/21 12:20	02/17/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144564-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144564-1

No Detections.

Client Sample ID: MW-136S_021521 — Lab Sample ID: 240-144564-2

No Detections.

Client Sample ID: MW-107S_021521 — Lab Sample ID: 240-144564-3

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144564-1

Client Sample ID: TRIP BLANK

Date Collected: 02/15/21 00:00
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144564-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 21:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 21:06	1
Tetrachloroethene	1.0	U *+	1.0	0.15	ug/L			02/24/21 21:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 21:06	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 21:06	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 21:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*75 - 130*		*02/24/21 21:06*	*1*
4-Bromofluorobenzene (Surr)	*61*		*47 - 134*		*02/24/21 21:06*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*02/24/21 21:06*	*1*
Dibromofluoromethane (Surr)	*114*		*78 - 129*		*02/24/21 21:06*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144564-1

Client Sample ID: MW-136S_021521
Date Collected: 02/15/21 10:50
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144564-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/24/21 16:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/24/21 16:29*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 18:36	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 18:36	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 18:36	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 18:36	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 18:36	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 18:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*		*02/25/21 18:36*	*1*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*		*02/25/21 18:36*	*1*
Toluene-d8 (Surr)	*94*		*69 - 122*		*02/25/21 18:36*	*1*
Dibromofluoromethane (Surr)	*85*		*78 - 129*		*02/25/21 18:36*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144564-1

Client Sample ID: MW-107S_021521
Date Collected: 02/15/21 12:20
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144564-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/24/21 16:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/24/21 16:54*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 19:01	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 19:01	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 19:01	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 19:01	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 19:01	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 19:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*		*02/25/21 19:01*	*1*
4-Bromofluorobenzene (Surr)	*101*		*47 - 134*		*02/25/21 19:01*	*1*
Toluene-d8 (Surr)	*94*		*69 - 122*		*02/25/21 19:01*	*1*
Dibromofluoromethane (Surr)	*82*		*78 - 129*		*02/25/21 19:01*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144564-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144564-1	TRIP BLANK	94	61	80	114
240-144564-2	MW-136S_021521	86	95	94	85
240-144564-3	MW-107S_021521	86	101	94	82
240-144568-B-3 MS	Matrix Spike	71 S1-	86	92	87
240-144568-E-3 MSD	Matrix Spike Duplicate	69 S1-	91	93	88
240-144661-D-2 MS	Matrix Spike	84	99	93	86
240-144661-E-2 MSD	Matrix Spike Duplicate	84	99	94	87
LCS 240-474305/4	Lab Control Sample	88	87	89	91
LCS 240-474500/4	Lab Control Sample	85	101	93	86
MB 240-474305/7	Method Blank	98	67	84	103
MB 240-474500/7	Method Blank	86	98	94	86

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144564-2	MW-136S_021521	82
240-144564-3	MW-107S_021521	83
240-144586-J-4 MS	Matrix Spike	83
240-144586-J-4 MSD	Matrix Spike Duplicate	84
LCS 240-474283/4	Lab Control Sample	84
MB 240-474283/5	Method Blank	86

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474305/7
Matrix: Water
Analysis Batch: 474305

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 14:13	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 14:13	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 14:13	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 14:13	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 14:13	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 14:13	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 130*		*02/24/21 14:13*	*1*
4-Bromofluorobenzene (Surr)	*67*		*47 - 134*		*02/24/21 14:13*	*1*
Toluene-d8 (Surr)	*84*		*69 - 122*		*02/24/21 14:13*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*02/24/21 14:13*	*1*

Lab Sample ID: LCS 240-474305/4
Matrix: Water
Analysis Batch: 474305

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.8		ug/L		108	73 - 129
cis-1,2-Dichloroethene	10.0	9.69		ug/L		97	75 - 124
Tetrachloroethene	10.0	12.6	*+	ug/L		126	70 - 125
trans-1,2-Dichloroethene	10.0	11.0		ug/L		110	74 - 130
Trichloroethene	10.0	10.3		ug/L		103	71 - 121
Vinyl chloride	10.0	9.04		ug/L		90	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 130*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*
Toluene-d8 (Surr)	*89*		*69 - 122*
Dibromofluoromethane (Surr)	*91*		*78 - 129*

Lab Sample ID: 240-144568-B-3 MS
Matrix: Water
Analysis Batch: 474305

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.41		ug/L		94	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	8.71		ug/L		87	68 - 121
Tetrachloroethene	1.0	U *+	10.0	11.6		ug/L		116	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.81		ug/L		98	69 - 126
Trichloroethene	1.0	U	10.0	9.03		ug/L		90	56 - 124
Vinyl chloride	1.0	U	10.0	8.44		ug/L		84	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*71*	*S1-*	*75 - 130*
4-Bromofluorobenzene (Surr)	*86*		*47 - 134*
Toluene-d8 (Surr)	*92*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144568-B-3 MS
Matrix: Water
Analysis Batch: 474305

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	87		78 - 129

Lab Sample ID: 240-144568-E-3 MSD
Matrix: Water
Analysis Batch: 474305

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.22		ug/L		92	64 - 132	2	35
cis-1,2-Dichloroethene	1.0	U	10.0	8.56		ug/L		86	68 - 121	2	35
Tetrachloroethene	1.0	U *+	10.0	11.0		ug/L		110	52 - 129	6	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.16		ug/L		92	69 - 126	7	35
Trichloroethene	1.0	U	10.0	8.83		ug/L		88	56 - 124	2	35
Vinyl chloride	1.0	U	10.0	8.72		ug/L		87	49 - 136	3	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	69	S1-	75 - 130
4-Bromofluorobenzene (Surr)	91		47 - 134
Toluene-d8 (Surr)	93		69 - 122
Dibromofluoromethane (Surr)	88		78 - 129

Lab Sample ID: MB 240-474500/7
Matrix: Water
Analysis Batch: 474500

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 14:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 14:52	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 14:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 14:52	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 14:52	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 14:52	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	86		75 - 130		02/25/21 14:52	1
4-Bromofluorobenzene (Surr)	98		47 - 134		02/25/21 14:52	1
Toluene-d8 (Surr)	94		69 - 122		02/25/21 14:52	1
Dibromofluoromethane (Surr)	86		78 - 129		02/25/21 14:52	1

Lab Sample ID: LCS 240-474500/4
Matrix: Water
Analysis Batch: 474500

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	8.93		ug/L		89	73 - 129
cis-1,2-Dichloroethene	10.0	9.08		ug/L		91	75 - 124
Tetrachloroethene	10.0	9.68		ug/L		97	70 - 125
trans-1,2-Dichloroethene	10.0	9.29		ug/L		93	74 - 130
Trichloroethene	10.0	8.87		ug/L		89	71 - 121

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 240-474500/4
Matrix: Water
Analysis Batch: 474500

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Vinyl chloride			10.0	10.7		ug/L		107	61 - 134		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*75 - 130*
4-Bromofluorobenzene (Surr)	*101*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*86*		*78 - 129*

Lab Sample ID: 240-144661-D-2 MS
Matrix: Water
Analysis Batch: 474500

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
cis-1,2-Dichloroethene	1.0	U	10.0	8.81		ug/L		88	68 - 121		
Tetrachloroethene	1.0	U	10.0	8.35		ug/L		84	52 - 129		
trans-1,2-Dichloroethene	1.0	U	10.0	8.36		ug/L		84	69 - 126		
Trichloroethene	1.0	U	10.0	8.22		ug/L		82	56 - 124		
Vinyl chloride	20		10.0	30.2		ug/L		102	49 - 136		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*
4-Bromofluorobenzene (Surr)	*99*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*86*		*78 - 129*

Lab Sample ID: 240-144661-E-2 MSD
Matrix: Water
Analysis Batch: 474500

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
cis-1,2-Dichloroethene	1.0	U	10.0	8.80		ug/L		88	68 - 121	0	35
Tetrachloroethene	1.0	U	10.0	8.53		ug/L		85	52 - 129	2	35
trans-1,2-Dichloroethene	1.0	U	10.0	8.64		ug/L		86	69 - 126	3	35
Trichloroethene	1.0	U	10.0	8.36		ug/L		84	56 - 124	2	35
Vinyl chloride	20		10.0	29.8		ug/L		98	49 - 136	1	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*
4-Bromofluorobenzene (Surr)	*99*		*47 - 134*
Toluene-d8 (Surr)	*94*		*69 - 122*
Dibromofluoromethane (Surr)	*87*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474283/5
Matrix: Water
Analysis Batch: 474283

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/24/21 11:01	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*		*02/24/21 11:01*	*1*

Lab Sample ID: LCS 240-474283/4
Matrix: Water
Analysis Batch: 474283

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.5		ug/L		105	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*

Lab Sample ID: 240-144586-J-4 MS
Matrix: Water
Analysis Batch: 474283

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	10.3		ug/L		103	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*

Lab Sample ID: 240-144586-J-4 MSD
Matrix: Water
Analysis Batch: 474283

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.1		ug/L		101	46 - 170	2	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144564-1

GC/MS VOA

Analysis Batch: 474283

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144564-2	MW-136S_021521	Total/NA	Water	8260B SIM	
240-144564-3	MW-107S_021521	Total/NA	Water	8260B SIM	
MB 240-474283/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474283/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144586-J-4 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144586-J-4 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474305

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144564-1	TRIP BLANK	Total/NA	Water	8260B	
MB 240-474305/7	Method Blank	Total/NA	Water	8260B	
LCS 240-474305/4	Lab Control Sample	Total/NA	Water	8260B	
240-144568-B-3 MS	Matrix Spike	Total/NA	Water	8260B	
240-144568-E-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 474500

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144564-2	MW-136S_021521	Total/NA	Water	8260B	
240-144564-3	MW-107S_021521	Total/NA	Water	8260B	
MB 240-474500/7	Method Blank	Total/NA	Water	8260B	
LCS 240-474500/4	Lab Control Sample	Total/NA	Water	8260B	
240-144661-D-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144661-E-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144564-1

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144564-1
Date Collected: 02/15/21 00:00
Matrix: Water
Date Received: 02/17/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474305	02/24/21 21:06	LRW	TAL CAN

Client Sample ID: MW-136S_021521
Lab Sample ID: 240-144564-2
Date Collected: 02/15/21 10:50
Matrix: Water
Date Received: 02/17/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474500	02/25/21 18:36	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474283	02/24/21 16:29	SAM	TAL CAN

Client Sample ID: MW-107S_021521
Lab Sample ID: 240-144564-3
Date Collected: 02/15/21 12:20
Matrix: Water
Date Received: 02/17/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474500	02/25/21 19:01	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474283	02/24/21 16:54	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144564-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

0-4/05

Chain of Custody Record

MICHIGAN TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

190

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; 3 weeks, 2 weeks, 1 week, 2 days, 1 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-136S_021521	2/15/21	1050		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3VOAs for 8260B SIM
MW-107S_021521	2/15/21	1220		6						6					N	G	X	X	X	X	X	X	X	4



Possible Hazard Identification: Non-Hazard; Flammable; Skin Irritant; Poison B; Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client; Disposal By Lab; Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
E Witherspoon	Arcadis	2/15/21 1700	Novi Cold Storage	Arcadis	2/15/21 1700
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	ARCADIS	2/16/21 1009		ETA	2/16/21 10:09
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
	ETA	2/16/21 12:40		ETA	2-17-21 800

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3/3/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 194564**
Canton Facility

Client Arcadis Site Name

Cooler Received on 2-17-21 Opened on 2-17-21

Cooler unpacked by: MathSmg

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # (NA) Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. (0.4) °C Corrected Cooler Temp. (0.5) °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	(Yes)	No
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?	(Y)	(Y) (Y)
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No	(NA) pH Strip Lot# HC907861
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ____	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? ____	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

WI-NC-099

DATA VERIFICATION REPORT

March 03, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144564-1
Sample date: 2021-02-15
Report received by CADENA: 2021-03-03
Initial Data Verification completed by CADENA: 2021-03-03
Number of Samples:3
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 474305 LCS recovery was outlying biased high for the following analyte: TETRACHLOROETHENE. Associated client sample results were non-detect so qualification was not required based on this high bias QC outlier.

GCMS VOC QC batch MS/MSD surrogate recovery outliers were not determined using a client sample so qualification was not required based on these sample-specific QC outliers.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144564-1

		Sample Name:	TRIP BLANK				MW-136S_021521				MW-107S_021521			
		Lab Sample ID:	2401445641				2401445642				2401445643			
		Sample Date:	2/15/2021				2/15/2021				2/15/2021			
	Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC														
	OSW-8260B													
	1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	OSW-8260BBSim													
	1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

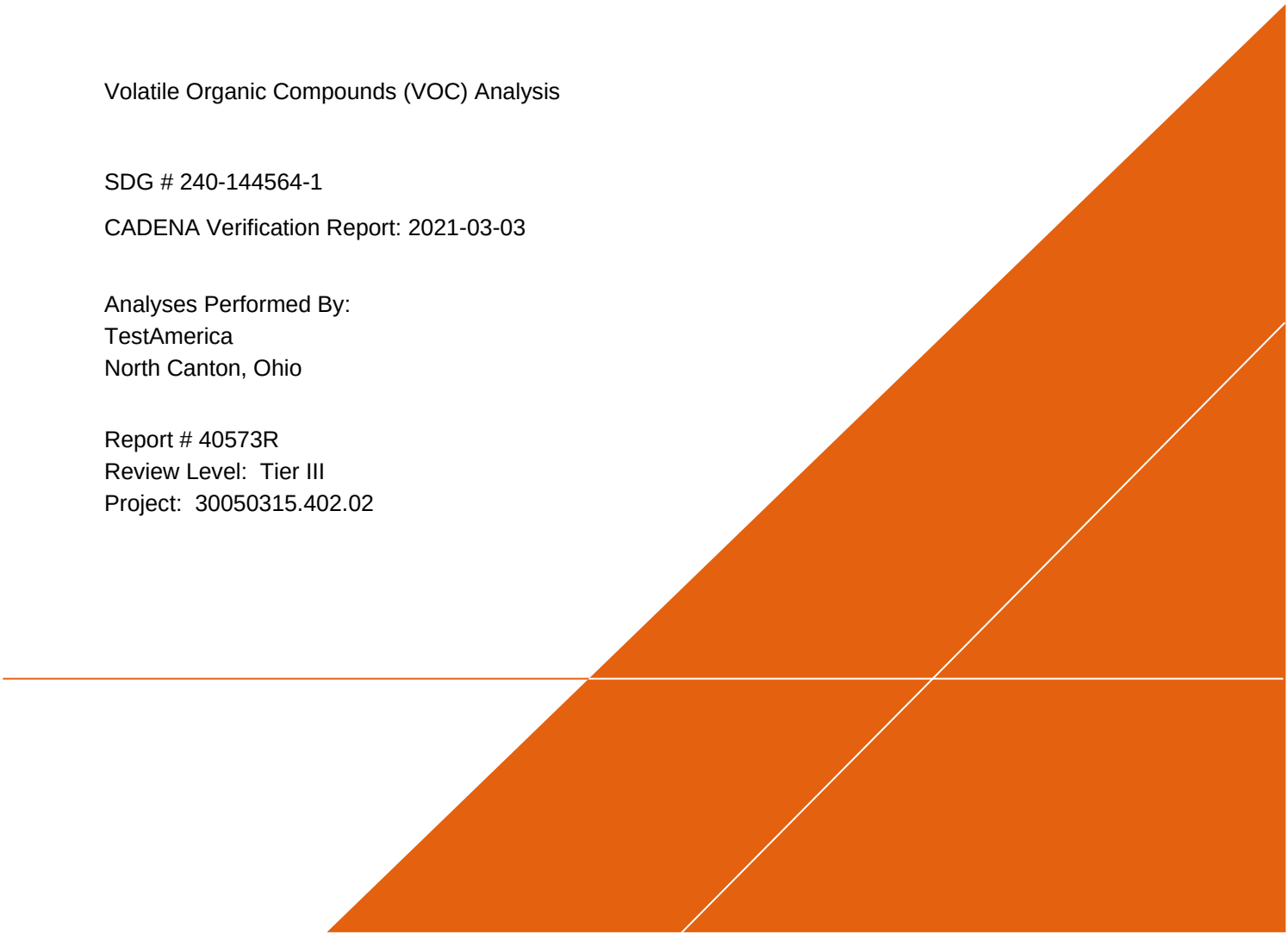
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144564-1

CADENA Verification Report: 2021-03-03

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40573R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144564-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144564-1	Water	02/15/2021		X	
MW-136S_021521	240-144564-2	Water	02/15/2021		X	X
MW-107S_021521	240-144564-3	Water	02/15/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial/Continuing	Lab file ID	Compound	Criteria
TRIP BLANK	CCV %D	UXR3152.D	Tetrachloroethene	+30.7%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action

Initial/Continuing	Criteria	Sample Result	Qualification
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1] RRF of 0.01 only applies to compounds which are typically poor responding compounds (i.e., ketones, 1,4-dioxane, etc.)

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X	X		
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

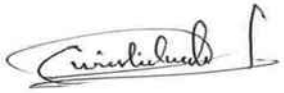
%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 17, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

0-4105

Chain of Custody Record

MICHIGAN TestAmerica

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

190

Regulatory program: DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		1 of 1 COCs
Phone: 248-994-2240	Sampler Name: Emma Witherspoon	TAT if different from below: 10 day; 3 weeks / 2 weeks / 1 week / 2 days / 1 day		For lab use only: Walk-in client; Lab sampling; Job/SDG No:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			
Project Number: 30050315.402.04	Shipping/Tracking No:			
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip blank
MW-136S_021521	2/15/21	1050		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B; 3VOAs for 8260BSIM
MW-107S_021521	2/15/21	1220		6						6					N	G	X	X	X	X	X	X	X	↓

240-144564 Chain of Custody

Possible Hazard Identification: Non-Hazard / Flammable / Skin Irritant / Poison B / Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client / Disposal By Lab / Archive For ___ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
E Witherspoon	Arcadis	2/15/21 1700	Novi Cold Storage	Arcadis	2/15/21 1700
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	ARCADIS	2/16/21 1009	Amanda Battenfield	ETA	2/16/21 10:09
Relinquished by: Amanda Battenfield	Company: ETA	Date/Time: 2/16/21 12:40	Received in Laboratory by:	Company: ETA	Date/Time: 2-17-21 800

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03/03/2021

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144564-1

Date Collected: 02/15/21 00:00

Matrix: Water

Date Received: 02/17/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 21:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 21:06	1
Tetrachloroethene	1.0	U *+	1.0	0.15	ug/L			02/24/21 21:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 21:06	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 21:06	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 21:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*75 - 130*		*02/24/21 21:06*	*1*
4-Bromofluorobenzene (Surr)	*61*		*47 - 134*		*02/24/21 21:06*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*02/24/21 21:06*	*1*
Dibromofluoromethane (Surr)	*114*		*78 - 129*		*02/24/21 21:06*	*1*

Client Sample ID: MW-136S_021521

Lab Sample ID: 240-144564-2

Date Collected: 02/15/21 10:50

Matrix: Water

Date Received: 02/17/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/24/21 16:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/24/21 16:29*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 18:36	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 18:36	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 18:36	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 18:36	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 18:36	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 18:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*		*02/25/21 18:36*	*1*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*		*02/25/21 18:36*	*1*
Toluene-d8 (Surr)	*94*		*69 - 122*		*02/25/21 18:36*	*1*
Dibromofluoromethane (Surr)	*85*		*78 - 129*		*02/25/21 18:36*	*1*

Client Sample ID: MW-107S_021521

Lab Sample ID: 240-144564-3

Date Collected: 02/15/21 12:20

Matrix: Water

Date Received: 02/17/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/24/21 16:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/24/21 16:54*	*1*

Client Sample ID: MW-107S_021521
Lab Sample ID: 240-144564-3
Date Collected: 02/15/21 12:20
Matrix: Water
Date Received: 02/17/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 19:01	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/25/21 19:01	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/25/21 19:01	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/25/21 19:01	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/25/21 19:01	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/25/21 19:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*		*02/25/21 19:01*	*1*
4-Bromofluorobenzene (Surr)	*101*		*47 - 134*		*02/25/21 19:01*	*1*
Toluene-d8 (Surr)	*94*		*69 - 122*		*02/25/21 19:01*	*1*
Dibromofluoromethane (Surr)	*82*		*78 - 129*		*02/25/21 19:01*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144703-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/8/2021 10:52:17 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
Review your project results through TotalAccess
Have a Question? Ask The Expert
Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144703-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 240-144703-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144703-1

Comments
No additional comments.

Receipt
The samples were received on 2/20/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.7º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144703-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144703-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144703-1	TRIP BLANK	Water	02/18/21 00:00	02/20/21 08:00	
240-144703-2	MW-108S_021821	Water	02/18/21 13:03	02/20/21 08:00	
240-144703-3	MW-142S_021821	Water	02/18/21 15:17	02/20/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144703-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144703-1

No Detections.

Client Sample ID: MW-108S_021821 — Lab Sample ID: 240-144703-2

No Detections.

Client Sample ID: MW-142S_021821 — Lab Sample ID: 240-144703-3

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144703-1

Client Sample ID: TRIP BLANK

Date Collected: 02/18/21 00:00
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144703-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 15:34	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 15:34	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 15:34	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 15:34	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 15:34	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 15:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*02/26/21 15:34*	*1*
4-Bromofluorobenzene (Surr)	*104*		*47 - 134*		*02/26/21 15:34*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*02/26/21 15:34*	*1*
Dibromofluoromethane (Surr)	*107*		*78 - 129*		*02/26/21 15:34*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144703-1

Client Sample ID: MW-108S_021821
Date Collected: 02/18/21 13:03
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144703-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 14:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*		*02/26/21 14:34*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 15:58	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 15:58	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 15:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 15:58	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 15:58	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 15:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*02/26/21 15:58*	*1*
4-Bromofluorobenzene (Surr)	*104*		*47 - 134*		*02/26/21 15:58*	*1*
Toluene-d8 (Surr)	*91*		*69 - 122*		*02/26/21 15:58*	*1*
Dibromofluoromethane (Surr)	*108*		*78 - 129*		*02/26/21 15:58*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144703-1

Client Sample ID: MW-142S_021821
Date Collected: 02/18/21 15:17
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144703-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 14:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/26/21 14:59*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 16:23	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 16:23	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 16:23	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 16:23	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 16:23	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 16:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*02/26/21 16:23*	*1*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*		*02/26/21 16:23*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*02/26/21 16:23*	*1*
Dibromofluoromethane (Surr)	*106*		*78 - 129*		*02/26/21 16:23*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144703-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144703-1	TRIP BLANK	104	104	90	107
240-144703-2	MW-108S_021821	104	104	91	108
240-144703-3	MW-142S_021821	104	103	92	106
240-144712-E-3 MS	Matrix Spike	92	103	94	93
240-144712-H-3 MSD	Matrix Spike Duplicate	93	103	94	94
LCS 240-474649/5	Lab Control Sample	93	103	93	94
MB 240-474649/8	Method Blank	101	103	91	103

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144703-2	MW-108S_021821	79
240-144703-3	MW-142S_021821	80
240-144712-L-3 MS	Matrix Spike	80
240-144712-L-3 MSD	Matrix Spike Duplicate	81
LCS 240-474632/4	Lab Control Sample	80
MB 240-474632/5	Method Blank	80

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474649/8
Matrix: Water
Analysis Batch: 474649

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 12:15	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 12:15	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 12:15	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 12:15	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 12:15	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 12:15	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*02/26/21 12:15*	*1*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*		*02/26/21 12:15*	*1*
Toluene-d8 (Surr)	*91*		*69 - 122*		*02/26/21 12:15*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*02/26/21 12:15*	*1*

Lab Sample ID: LCS 240-474649/5
Matrix: Water
Analysis Batch: 474649

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	20.0	20.0		ug/L		100	73 - 129
cis-1,2-Dichloroethene	20.0	19.8		ug/L		99	75 - 124
Tetrachloroethene	20.0	19.2		ug/L		96	70 - 125
trans-1,2-Dichloroethene	20.0	19.5		ug/L		97	74 - 130
Trichloroethene	20.0	18.2		ug/L		91	71 - 121
Vinyl chloride	20.0	23.3		ug/L		116	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*94*		*78 - 129*

Lab Sample ID: 240-144712-E-3 MS
Matrix: Water
Analysis Batch: 474649

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	20.0	19.7		ug/L		99	64 - 132
cis-1,2-Dichloroethene	1.0	U	20.0	20.1		ug/L		100	68 - 121
Tetrachloroethene	1.0	U	20.0	19.0		ug/L		95	52 - 129
trans-1,2-Dichloroethene	1.0	U	20.0	19.7		ug/L		98	69 - 126
Trichloroethene	1.0	U	20.0	17.6		ug/L		88	56 - 124
Vinyl chloride	1.0	U	20.0	25.7		ug/L		129	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*
Toluene-d8 (Surr)	*94*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144712-E-3 MS
Matrix: Water
Analysis Batch: 474649

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*93*		*78 - 129*

Lab Sample ID: 240-144712-H-3 MSD
Matrix: Water
Analysis Batch: 474649

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	20.0	20.7		ug/L		104	64 - 132	5	35
cis-1,2-Dichloroethene	1.0	U	20.0	21.0		ug/L		105	68 - 121	4	35
Tetrachloroethene	1.0	U	20.0	19.5		ug/L		97	52 - 129	2	35
trans-1,2-Dichloroethene	1.0	U	20.0	20.2		ug/L		101	69 - 126	3	35
Trichloroethene	1.0	U	20.0	19.0		ug/L		95	56 - 124	8	35
Vinyl chloride	1.0	U	20.0	25.1		ug/L		125	49 - 136	3	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*
Toluene-d8 (Surr)	*94*		*69 - 122*
Dibromofluoromethane (Surr)	*94*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474632/5
Matrix: Water
Analysis Batch: 474632

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 10:47	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/26/21 10:47*	*1*

Lab Sample ID: LCS 240-474632/4
Matrix: Water
Analysis Batch: 474632

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.5		ug/L		105	80 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*

Lab Sample ID: 240-144712-L-3 MS
Matrix: Water
Analysis Batch: 474632

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	10.2		ug/L		102	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*

Lab Sample ID: 240-144712-L-3 MSD
Matrix: Water
Analysis Batch: 474632

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.2		ug/L		102	46 - 170	0	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144703-1

GC/MS VOA

Analysis Batch: 474632

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144703-2	MW-108S_021821	Total/NA	Water	8260B SIM	
240-144703-3	MW-142S_021821	Total/NA	Water	8260B SIM	
MB 240-474632/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474632/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144712-L-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144712-L-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474649

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144703-1	TRIP BLANK	Total/NA	Water	8260B	
240-144703-2	MW-108S_021821	Total/NA	Water	8260B	
240-144703-3	MW-142S_021821	Total/NA	Water	8260B	
MB 240-474649/8	Method Blank	Total/NA	Water	8260B	
LCS 240-474649/5	Lab Control Sample	Total/NA	Water	8260B	
240-144712-E-3 MS	Matrix Spike	Total/NA	Water	8260B	
240-144712-H-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144703-1

Client Sample ID: TRIP BLANK
Date Collected: 02/18/21 00:00
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144703-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474649	02/26/21 15:34	HMB	TAL CAN

Client Sample ID: MW-108S_021821
Date Collected: 02/18/21 13:03
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144703-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474649	02/26/21 15:58	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		1	474632	02/26/21 14:34	SAM	TAL CAN

Client Sample ID: MW-142S_021821
Date Collected: 02/18/21 15:17
Date Received: 02/20/21 08:00

Lab Sample ID: 240-144703-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474649	02/26/21 16:23	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		1	474632	02/26/21 14:59	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144703-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

MICHIG190 TestAmerica — THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI. 48377	Sampler Name: Kara Donahue	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day (10 day)		Walk-in client:
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-108S_021821	2/18/21	1303		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260 B 3 VOAs for 8260 B SIM
MW-142S_021821	2/18/21	1517		6						6					N	G	X	X	X	X	X	X	X	1

240-144703 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Kara Donahue	Arcadis	2/18/21 1700	Novi Cold Storage	Arcadis	2/18/21 1700
Kara Donahue	Arcadis	2/19/21 10:11	Amanda Battenfield	ETA	2/19/21 10:11
Amanda Battenfield	ETA	2/19/21 1432	Received in Laboratory by:	TA	2-20-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 44703
Canton Facility

Client Arcadis Site Name

Cooler unpacked by:

Cooler Received on 2-20-21 Opened on 2-20-21

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.6 °C Corrected Cooler Temp. 1.7 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? Yes (No)
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #____ (Yes) No
17. Was a LL Hg or Me Hg trip blank present? ____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT

March 08, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144703-1
Sample date: 2021-02-18
Report received by CADENA: 2021-03-08
Initial Data Verification completed by CADENA: 2021-03-08
Number of Samples:3
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144703-1

		Sample Name:	TRIP BLANK				MW-108S_021821				MW-142S_021821			
		Lab Sample ID:	2401447031				2401447032				2401447033			
		Sample Date:	2/18/2021				2/18/2021				2/18/2021			
	Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC														
	OSW-8260B													
	1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
	OSW-8260BBSim													
	1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

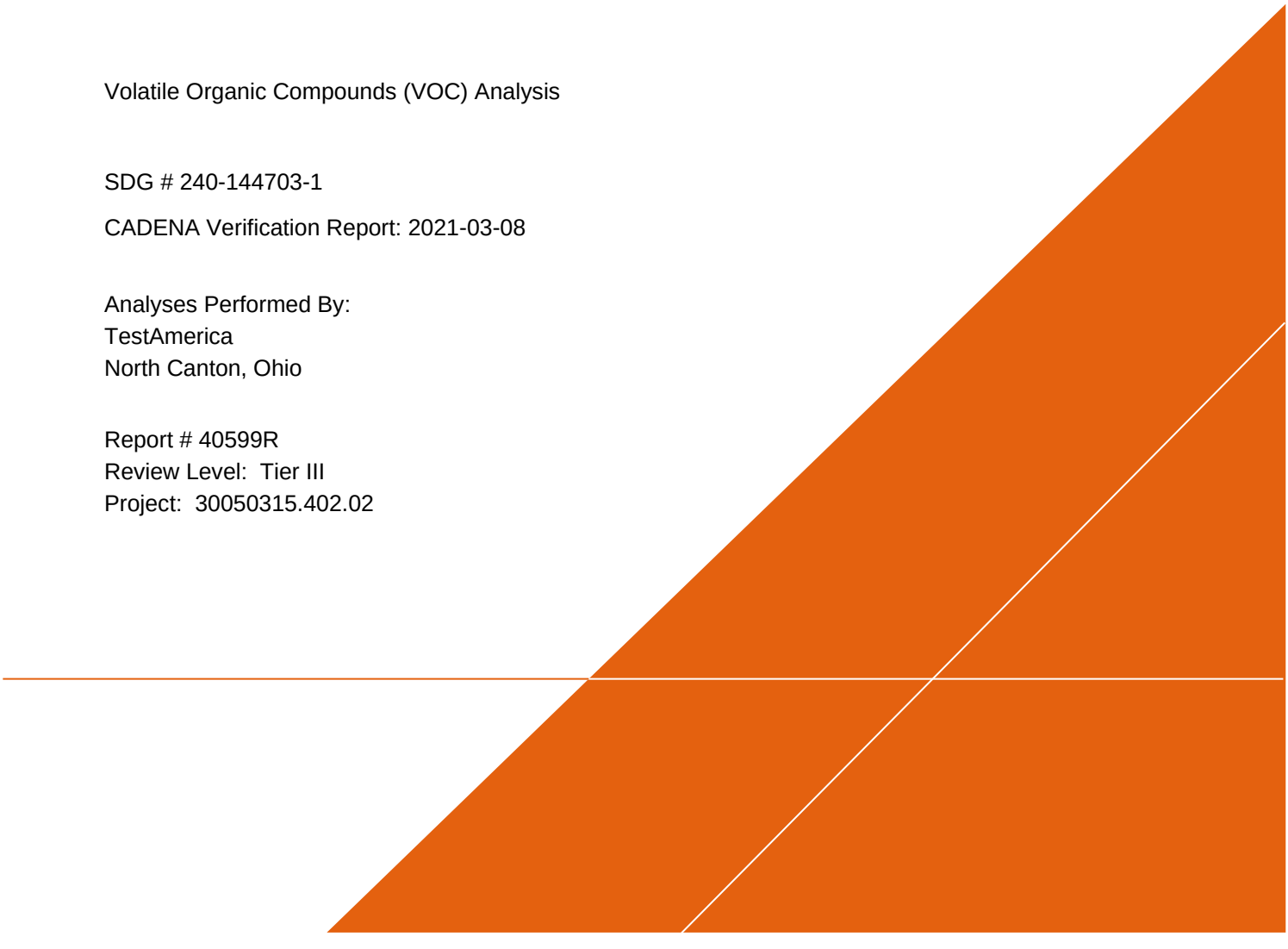
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144703-1

CADENA Verification Report: 2021-03-08

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40599R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144703-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144703-1	Water	02/18/2021		X	
MW-108S_021821	240-144703-2	Water	02/18/2021		X	X
MW-142S_021821	240-144703-3	Water	02/18/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

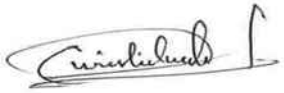
%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 17, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 18, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190 — TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI. 48377	Sampler Name: Kristoffer Donahue	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day — 10 day		Walk-in client: Lab sampling:
Phone: 248-994-2240	Method of Shipment/Carrier:			Job/SDG No:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite-C / Grab-G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-108S_021821	2/18/21	1303		6						6					N	G	X	X	X	X	X	X	X	3VOAs for 8260 B 3VOAs for 8260 B SIM
MW-142S_021821	2/18/21	1517		6						6					N	G	X	X	X	X	X	X	X	1

240-144703 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Kristoffer Donahue	Arcadis	2/18/21 1700	Novi Cold Storage	Arcadis	2/18/21 1700
Kristoffer Donahue	Arcadis	2/19/21 10:11	Amanda Battenfeld	ETA	2/19/21 10:11
Amanda Battenfeld	ETA	2/19/21 1432	Received in Laboratory by:	Company: TA	Date/Time: 2-20-21 800

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144703-1
Date Collected: 02/18/21 00:00
Matrix: Water
Date Received: 02/20/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 15:34	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 15:34	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 15:34	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 15:34	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 15:34	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 15:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*02/26/21 15:34*	*1*
4-Bromofluorobenzene (Surr)	*104*		*47 - 134*		*02/26/21 15:34*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*02/26/21 15:34*	*1*
Dibromofluoromethane (Surr)	*107*		*78 - 129*		*02/26/21 15:34*	*1*

Client Sample ID: MW-108S_021821
Lab Sample ID: 240-144703-2
Date Collected: 02/18/21 13:03
Matrix: Water
Date Received: 02/20/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 14:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*79*		*70 - 133*		*02/26/21 14:34*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 15:58	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 15:58	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 15:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 15:58	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 15:58	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 15:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*02/26/21 15:58*	*1*
4-Bromofluorobenzene (Surr)	*104*		*47 - 134*		*02/26/21 15:58*	*1*
Toluene-d8 (Surr)	*91*		*69 - 122*		*02/26/21 15:58*	*1*
Dibromofluoromethane (Surr)	*108*		*78 - 129*		*02/26/21 15:58*	*1*

Client Sample ID: MW-142S_021821
Lab Sample ID: 240-144703-3
Date Collected: 02/18/21 15:17
Matrix: Water
Date Received: 02/20/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 14:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/26/21 14:59*	*1*

Client Sample ID: MW-142S_021821
Lab Sample ID: 240-144703-3
Date Collected: 02/18/21 15:17
Matrix: Water
Date Received: 02/20/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 16:23	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/26/21 16:23	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/26/21 16:23	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/26/21 16:23	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/26/21 16:23	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/26/21 16:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*02/26/21 16:23*	*1*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*		*02/26/21 16:23*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*02/26/21 16:23*	*1*
Dibromofluoromethane (Surr)	*106*		*78 - 129*		*02/26/21 16:23*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-145164-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/24/2021 2:46:39 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145164-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145164-1

Job ID: 240-145164-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-145164-1

Comments
No additional comments.

Receipt
The samples were received on 3/2/2021 9:15 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.1° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145164-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145164-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-145164-1	TRIP BLANK	Water	02/26/21 00:00	03/02/21 09:15	
240-145164-2	MW-132S_022621	Water	02/26/21 13:24	03/02/21 09:15	
240-145164-3	MW-131S_022621	Water	02/26/21 16:03	03/02/21 09:15	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145164-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-145164-1

No Detections.

Client Sample ID: MW-132S_022621 — Lab Sample ID: 240-145164-2

No Detections.

Client Sample ID: MW-131S_022621 — Lab Sample ID: 240-145164-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	1.1		1.0	0.20	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145164-1

Client Sample ID: TRIP BLANK

Date Collected: 02/26/21 00:00
Date Received: 03/02/21 09:15

Lab Sample ID: 240-145164-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 21:28	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/04/21 21:28	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/04/21 21:28	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 21:28	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/04/21 21:28	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/04/21 21:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*120*		*75 - 130*		*03/04/21 21:28*	*1*
4-Bromofluorobenzene (Surr)	*57*		*47 - 134*		*03/04/21 21:28*	*1*
Toluene-d8 (Surr)	*69*		*69 - 122*		*03/04/21 21:28*	*1*
Dibromofluoromethane (Surr)	*115*		*78 - 129*		*03/04/21 21:28*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145164-1

Client Sample ID: MW-132S_022621
Date Collected: 02/26/21 13:24
Date Received: 03/02/21 09:15

Lab Sample ID: 240-145164-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/04/21 19:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*70 - 133*		*03/04/21 19:21*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 21:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/04/21 21:52	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/04/21 21:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 21:52	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/04/21 21:52	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/04/21 21:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*115*		*75 - 130*		*03/04/21 21:52*	*1*
4-Bromofluorobenzene (Surr)	*69*		*47 - 134*		*03/04/21 21:52*	*1*
Toluene-d8 (Surr)	*85*		*69 - 122*		*03/04/21 21:52*	*1*
Dibromofluoromethane (Surr)	*124*		*78 - 129*		*03/04/21 21:52*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145164-1

Client Sample ID: MW-131S_022621
Date Collected: 02/26/21 16:03
Date Received: 03/02/21 09:15

Lab Sample ID: 240-145164-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/04/21 20:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*70 - 133*		*03/04/21 20:38*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 23:04	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/04/21 23:04	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/04/21 23:04	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 23:04	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/04/21 23:04	1
Vinyl chloride	**1.1**		1.0	0.20	ug/L			03/04/21 23:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*75 - 130*		*03/04/21 23:04*	*1*
4-Bromofluorobenzene (Surr)	*68*		*47 - 134*		*03/04/21 23:04*	*1*
Toluene-d8 (Surr)	*95*		*69 - 122*		*03/04/21 23:04*	*1*
Dibromofluoromethane (Surr)	*105*		*78 - 129*		*03/04/21 23:04*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145164-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-145164-1	TRIP BLANK	120	57	69	115
240-145164-2	MW-132S_022621	115	69	85	124
240-145164-2 MS	MW-132S-MS_022621	95	93	89	92
240-145164-2 MSD	MW-132S-MSD_022621	84	85	87	90
240-145164-3	MW-131S_022621	106	68	95	105
LCS 240-475466/4	Lab Control Sample	84	87	86	88
MB 240-475466/7	Method Blank	106	64	79	109

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-145164-2	MW-132S_022621	95
240-145164-2 MS	MW-132S-MS_022621	94
240-145164-2 MSD	MW-132S-MSD_022621	96
240-145164-3	MW-131S_022621	91
LCS 240-475458/4	Lab Control Sample	84
MB 240-475458/5	Method Blank	87

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475466/7
Matrix: Water
Analysis Batch: 475466

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 16:39	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/04/21 16:39	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/04/21 16:39	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 16:39	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/04/21 16:39	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/04/21 16:39	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*75 - 130*		*03/04/21 16:39*	*1*
4-Bromofluorobenzene (Surr)	*64*		*47 - 134*		*03/04/21 16:39*	*1*
Toluene-d8 (Surr)	*79*		*69 - 122*		*03/04/21 16:39*	*1*
Dibromofluoromethane (Surr)	*109*		*78 - 129*		*03/04/21 16:39*	*1*

Lab Sample ID: LCS 240-475466/4
Matrix: Water
Analysis Batch: 475466

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	11.0		ug/L		110	73 - 129
cis-1,2-Dichloroethene	10.0	9.51		ug/L		95	75 - 124
Tetrachloroethene	10.0	12.0		ug/L		120	70 - 125
trans-1,2-Dichloroethene	10.0	10.3		ug/L		103	74 - 130
Trichloroethene	10.0	9.56		ug/L		96	71 - 121
Vinyl chloride	10.0	10.8		ug/L		108	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*
Toluene-d8 (Surr)	*86*		*69 - 122*
Dibromofluoromethane (Surr)	*88*		*78 - 129*

Lab Sample ID: 240-145164-2 MS
Matrix: Water
Analysis Batch: 475466

Client Sample ID: MW-132S-MS_022621
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	11.0		ug/L		110	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	9.35		ug/L		93	68 - 121
Tetrachloroethene	1.0	U	10.0	12.4		ug/L		124	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	10.6		ug/L		106	69 - 126
Trichloroethene	1.0	U	10.0	9.05		ug/L		90	56 - 124
Vinyl chloride	1.0	U	10.0	10.9		ug/L		109	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*95*		*75 - 130*
4-Bromofluorobenzene (Surr)	*93*		*47 - 134*
Toluene-d8 (Surr)	*89*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-145164-2 MS
Matrix: Water
Analysis Batch: 475466

Client Sample ID: MW-132S-MS_022621
Prep Type: Total/NA

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*92*		*78 - 129*

Lab Sample ID: 240-145164-2 MSD
Matrix: Water
Analysis Batch: 475466

Client Sample ID: MW-132S-MSD_022621
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.07		ug/L		91	64 - 132	19	35
cis-1,2-Dichloroethene	1.0	U	10.0	8.16		ug/L		82	68 - 121	14	35
Tetrachloroethene	1.0	U	10.0	10.4		ug/L		104	52 - 129	18	35
trans-1,2-Dichloroethene	1.0	U	10.0	8.75		ug/L		87	69 - 126	20	35
Trichloroethene	1.0	U	10.0	9.44		ug/L		94	56 - 124	4	35
Vinyl chloride	1.0	U	10.0	9.34		ug/L		93	49 - 136	15	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*
4-Bromofluorobenzene (Surr)	*85*		*47 - 134*
Toluene-d8 (Surr)	*87*		*69 - 122*
Dibromofluoromethane (Surr)	*90*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-475458/5
Matrix: Water
Analysis Batch: 475458

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/04/21 11:50	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*70 - 133*		*03/04/21 11:50*	*1*

Lab Sample ID: LCS 240-475458/4
Matrix: Water
Analysis Batch: 475458

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	8.91		ug/L		89	80 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*

Lab Sample ID: 240-145164-2 MS
Matrix: Water
Analysis Batch: 475458

Client Sample ID: MW-132S-MS_022621
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	8.58		ug/L		86	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*94*		*70 - 133*

Lab Sample ID: 240-145164-2 MSD
Matrix: Water
Analysis Batch: 475458

Client Sample ID: MW-132S-MSD_022621
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	8.65		ug/L		86	46 - 170	1	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*96*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145164-1

GC/MS VOA

Analysis Batch: 475458

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-145164-2	MW-132S_022621	Total/NA	Water	8260B SIM	
240-145164-3	MW-131S_022621	Total/NA	Water	8260B SIM	
MB 240-475458/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-475458/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-145164-2 MS	MW-132S-MS_022621	Total/NA	Water	8260B SIM	
240-145164-2 MSD	MW-132S-MSD_022621	Total/NA	Water	8260B SIM	

Analysis Batch: 475466

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-145164-1	TRIP BLANK	Total/NA	Water	8260B	
240-145164-2	MW-132S_022621	Total/NA	Water	8260B	
240-145164-3	MW-131S_022621	Total/NA	Water	8260B	
MB 240-475466/7	Method Blank	Total/NA	Water	8260B	
LCS 240-475466/4	Lab Control Sample	Total/NA	Water	8260B	
240-145164-2 MS	MW-132S-MS_022621	Total/NA	Water	8260B	
240-145164-2 MSD	MW-132S-MSD_022621	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145164-1

Client Sample ID: TRIP BLANK
Date Collected: 02/26/21 00:00
Date Received: 03/02/21 09:15

Lab Sample ID: 240-145164-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475466	03/04/21 21:28	LRW	TAL CAN

Client Sample ID: MW-132S_022621
Date Collected: 02/26/21 13:24
Date Received: 03/02/21 09:15

Lab Sample ID: 240-145164-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475466	03/04/21 21:52	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	475458	03/04/21 19:21	SAM	TAL CAN

Client Sample ID: MW-131S_022621
Date Collected: 02/26/21 16:03
Date Received: 03/02/21 09:15

Lab Sample ID: 240-145164-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	475466	03/04/21 23:04	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	475458	03/04/21 20:38	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-145164-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

MICHIGA 190

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Kara Donahue	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client: Lab sampling:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Job/SDG No:
Project Number: 30050315.402.04	Shipping/Tracking No:			
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-132S_022621	2/26/21	1324		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-132S-MS_022621	2/26/21	1324		6						6					N	G	X	X	X	X	X	X	X	
MW-132S-MSD_022621	2/26/21	1324		6						6					N	G	X	X	X	X	X	X	X	
MW-131S_022621	2/26/21	1603		6						6					N	G	X	X	X	X	X	X	X	

240-145164 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by: Kara Donahue	Company: Arcadis	Date/Time: 2/26/21 1730	Received by: Novi Cold Storage	Company: Arcadis	Date/Time: 2/26/21 1730
Relinquished by: RACHEL BIELAK	Company: ARCADIS	Date/Time: 3/1/21 1100	Received by: Amanda Battershell	Company: ETA	Date/Time: 3/1/21 1101
Relinquished by: Amanda Battershell	Company: ETA	Date/Time: 3/1/21 1253	Received in Laboratory by:	Company: ETA	Date/Time: 3-2-21 915

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3/24/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 175164
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Matt

Cooler Received on 3-2-21 Opened on 3-2-21

FedEx: 1st (Grd) Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # 177 Foam Box Client Cooler Box Other _____

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2.0 °C Corrected Cooler Temp. 2.1 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? (Yes) No
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)? (Y) (Y) (Y)
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# **HC022887**
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 212801F (Yes) No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes (No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page | Samples processed by:

_____

_____

_____

_____

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

WI-NC-099

DATA VERIFICATION REPORT



March 24, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 145164-1
Sample date: 2021-02-26
Report received by CADENA: 2021-03-24
Initial Data Verification completed by CADENA: 2021-03-24
Number of Samples:3
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, MS/MSD Recovery, MS/MSD RPD, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 145164-1

		Sample Name:	TRIP BLANK				MW-132S_022621				MW-131S_022621			
		Lab Sample ID:	2401451641				2401451642				2401451643			
		Sample Date:	2/26/2021				2/26/2021				2/26/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC													
OSW-8260B													
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	1.1	1.0	ug/l	---
OSW-8260BBSim													
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

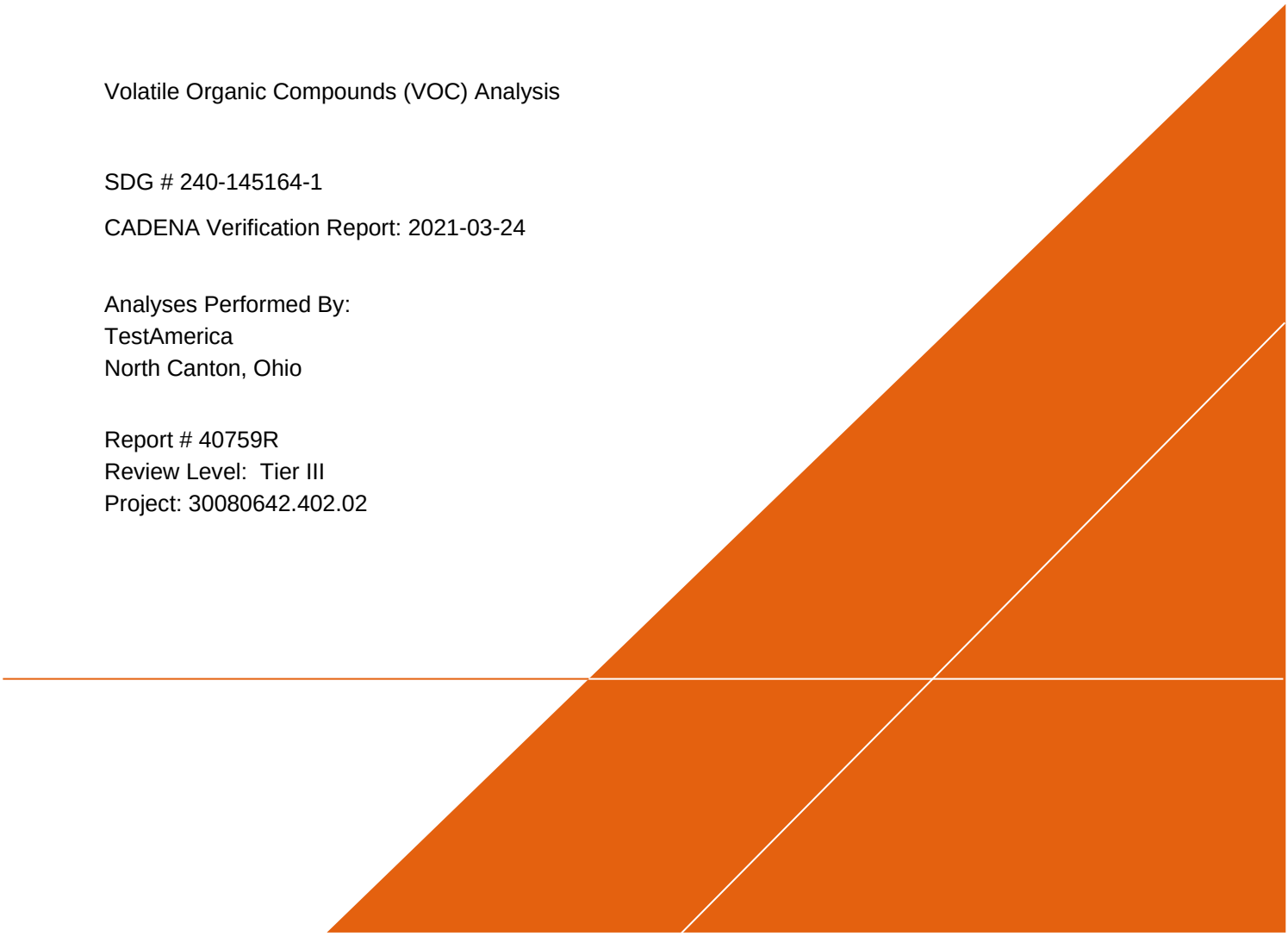
Volatile Organic Compounds (VOC) Analysis

SDG # 240-145164-1

CADENA Verification Report: 2021-03-24

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40759R
Review Level: Tier III
Project: 30080642.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-145164-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-145164-1	Water	02/26/2021		X	
MW-132S_022621	240-145164-2	Water	02/26/2021		X	X
MW-131S_022621	240-145164-3	Water	02/26/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

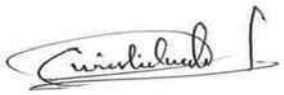
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 27, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 29, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

MICHIGA 190

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 248-994-2240	Sampler Name: Kara Donahue	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day		Walk-in client: Lab sampling:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	---	---		X						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-132S_022621	2/26/21	1324		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM
MW-132S-MS_022621	2/26/21	1324		6						6					N	G	X	X	X	X	X	X	X	
MW-132S-MSD_022621	2/26/21	1324		6						6					N	G	X	X	X	X	X	X	X	
MW-131S_022621	2/26/21	1003		6						6					N	G	X	X	X	X	X	X	X	

240-145164 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: Kara Donahue	Arcadis	2/26/21	1730	Received by: Novi Cold Storage	Arcadis	2/26/21	1730
Relinquished by: RACHEL BIELAK	ARCADIS	3/1/21	1100	Received by: Amanda Battershell	ETA	3/1/21	1101
Relinquished by: Amanda Battershell	ETA	3/1/21	1253	Received in Laboratory by:	ETA	3-2-21	915

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Client Sample ID: TRIP BLANK

Lab Sample ID: 240-145164-1

Date Collected: 02/26/21 00:00
Matrix: Water
Date Received: 03/02/21 09:15

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 21:28	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/04/21 21:28	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/04/21 21:28	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 21:28	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/04/21 21:28	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/04/21 21:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*120*		*75 - 130*		*03/04/21 21:28*	*1*
4-Bromofluorobenzene (Surr)	*57*		*47 - 134*		*03/04/21 21:28*	*1*
Toluene-d8 (Surr)	*69*		*69 - 122*		*03/04/21 21:28*	*1*
Dibromofluoromethane (Surr)	*115*		*78 - 129*		*03/04/21 21:28*	*1*

Client Sample ID: MW-132S_022621

Lab Sample ID: 240-145164-2

Date Collected: 02/26/21 13:24
Matrix: Water
Date Received: 03/02/21 09:15

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/04/21 19:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*95*		*70 - 133*		*03/04/21 19:21*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 21:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/04/21 21:52	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/04/21 21:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 21:52	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/04/21 21:52	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/04/21 21:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*115*		*75 - 130*		*03/04/21 21:52*	*1*
4-Bromofluorobenzene (Surr)	*69*		*47 - 134*		*03/04/21 21:52*	*1*
Toluene-d8 (Surr)	*85*		*69 - 122*		*03/04/21 21:52*	*1*
Dibromofluoromethane (Surr)	*124*		*78 - 129*		*03/04/21 21:52*	*1*

Client Sample ID: MW-131S_022621

Lab Sample ID: 240-145164-3

Date Collected: 02/26/21 16:03
Matrix: Water
Date Received: 03/02/21 09:15

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			03/04/21 20:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*91*		*70 - 133*		*03/04/21 20:38*	*1*

Client Sample ID: MW-131S_022621
Lab Sample ID: 240-145164-3
Date Collected: 02/26/21 16:03
Matrix: Water
Date Received: 03/02/21 09:15

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 23:04	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/04/21 23:04	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/04/21 23:04	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/04/21 23:04	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/04/21 23:04	1
Vinyl chloride	**1.1**		1.0	0.20	ug/L			03/04/21 23:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*75 - 130*		*03/04/21 23:04*	*1*
4-Bromofluorobenzene (Surr)	*68*		*47 - 134*		*03/04/21 23:04*	*1*
Toluene-d8 (Surr)	*95*		*69 - 122*		*03/04/21 23:04*	*1*
Dibromofluoromethane (Surr)	*105*		*78 - 129*		*03/04/21 23:04*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144750-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/9/2021 9:59:04 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144750-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144750-1

Job ID: 240-144750-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144750-1

Comments
No additional comments.

Receipt
The samples were received on 2/23/2021 9:20 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.6º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144750-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144750-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144750-1	TRIP BLANK	Water	02/19/21 00:00	02/23/21 09:20	
240-144750-2	MW-134S_021921	Water	02/19/21 11:55	02/23/21 09:20	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144750-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144750-1

No Detections.

Client Sample ID: MW-134S_021921 — Lab Sample ID: 240-144750-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144750-1

Client Sample ID: TRIP BLANK
Date Collected: 02/19/21 00:00
Date Received: 02/23/21 09:20

Lab Sample ID: 240-144750-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 15:35	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 15:35	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 15:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 15:35	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 15:35	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 15:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*75 - 130*		*03/01/21 15:35*	*1*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*		*03/01/21 15:35*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*03/01/21 15:35*	*1*
Dibromofluoromethane (Surr)	*110*		*78 - 129*		*03/01/21 15:35*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144750-1

Client Sample ID: MW-134S_021921
Date Collected: 02/19/21 11:55
Date Received: 02/23/21 09:20

Lab Sample ID: 240-144750-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 16:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*		*02/26/21 16:44*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 16:00	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 16:00	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 16:00	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 16:00	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 16:00	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 16:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*03/01/21 16:00*	*1*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*		*03/01/21 16:00*	*1*
Toluene-d8 (Surr)	*91*		*69 - 122*		*03/01/21 16:00*	*1*
Dibromofluoromethane (Surr)	*108*		*78 - 129*		*03/01/21 16:00*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144750-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144750-1	TRIP BLANK	106	103	90	110
240-144750-2	MW-134S_021921	104	103	91	108
240-144754-B-2 MS	Matrix Spike	93	104	94	93
240-144754-B-2 MSD	Matrix Spike Duplicate	93	103	93	95
LCS 240-474864/5	Lab Control Sample	92	101	93	91
MB 240-474864/8	Method Blank	101	102	93	99

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144711-O-2 MS	Matrix Spike	85
240-144711-O-2 MSD	Matrix Spike Duplicate	86
240-144750-2	MW-134S_021921	84
LCS 240-474631/4	Lab Control Sample	82
MB 240-474631/5	Method Blank	80

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474864/8
Matrix: Water
Analysis Batch: 474864

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 13:08	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 13:08	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 13:08	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 13:08	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 13:08	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 13:08	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*75 - 130*		*03/01/21 13:08*	*1*
4-Bromofluorobenzene (Surr)	*102*		*47 - 134*		*03/01/21 13:08*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*03/01/21 13:08*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*03/01/21 13:08*	*1*

Lab Sample ID: LCS 240-474864/5
Matrix: Water
Analysis Batch: 474864

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	20.0	20.5		ug/L		103	73 - 129
cis-1,2-Dichloroethene	20.0	20.9		ug/L		104	75 - 124
Tetrachloroethene	20.0	20.8		ug/L		104	70 - 125
trans-1,2-Dichloroethene	20.0	20.5		ug/L		102	74 - 130
Trichloroethene	20.0	19.8		ug/L		99	71 - 121
Vinyl chloride	20.0	23.6		ug/L		118	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*
4-Bromofluorobenzene (Surr)	*101*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*91*		*78 - 129*

Lab Sample ID: 240-144754-B-2 MS
Matrix: Water
Analysis Batch: 474864

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	500	U	10000	9650		ug/L		96	64 - 132
Tetrachloroethene	500	U	10000	9480		ug/L		95	52 - 129
trans-1,2-Dichloroethene	210	J	10000	9670		ug/L		95	69 - 126
Trichloroethene	500	U	10000	9110		ug/L		91	56 - 124
Vinyl chloride	12000		10000	22900		ug/L		111	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*104*		*47 - 134*
Toluene-d8 (Surr)	*94*		*69 - 122*
Dibromofluoromethane (Surr)	*93*		*78 - 129*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144754-B-2 MSD
Matrix: Water
Analysis Batch: 474864

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	500	U	10000	10800		ug/L		108	64 - 132	11	35
Tetrachloroethene	500	U	10000	10200		ug/L		102	52 - 129	7	35
trans-1,2-Dichloroethene	210	J	10000	10800		ug/L		106	69 - 126	11	35
Trichloroethene	500	U	10000	9990		ug/L		100	56 - 124	9	35
Vinyl chloride	12000		10000	25200		ug/L		134	49 - 136	9	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*95*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474631/5
Matrix: Water
Analysis Batch: 474631

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 10:51	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*		*02/26/21 10:51*	*1*

Lab Sample ID: LCS 240-474631/4
Matrix: Water
Analysis Batch: 474631

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	9.80		ug/L		98	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144711-O-2 MS
Matrix: Water
Analysis Batch: 474631

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	9.26		ug/L		93	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*70 - 133*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144711-O-2 MSD
Matrix: Water
Analysis Batch: 474631

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.91		ug/L		99	46 - 170	7	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144750-1

GC/MS VOA

Analysis Batch: 474631

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144750-2	MW-134S_021921	Total/NA	Water	8260B SIM	
MB 240-474631/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474631/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144711-O-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144711-O-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474864

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144750-1	TRIP BLANK	Total/NA	Water	8260B	
240-144750-2	MW-134S_021921	Total/NA	Water	8260B	
MB 240-474864/8	Method Blank	Total/NA	Water	8260B	
LCS 240-474864/5	Lab Control Sample	Total/NA	Water	8260B	
240-144754-B-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144754-B-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144750-1

Client Sample ID: TRIP BLANK
Date Collected: 02/19/21 00:00
Date Received: 02/23/21 09:20

Lab Sample ID: 240-144750-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474864	03/01/21 15:35	HMB	TAL CAN

Client Sample ID: MW-134S_021921
Date Collected: 02/19/21 11:55
Date Received: 02/23/21 09:20

Lab Sample ID: 240-144750-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474864	03/01/21 16:00	HMB	TAL CAN
Total/NA	Analysis	8260B SIM		1	474631	02/26/21 16:44	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144750-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

MICHIGAN TestAmerica 190
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton -- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Allyson Hartz	TAT if different from below ☐ 3 weeks ☑ 10 day ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client:
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling:
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn Ac/ NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 trip blank
MW-1345_021921	2/19/21	11:55		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-144750 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	2/19/21 14:30	Nal Cold Storage	Arcadis	2/19/21 14:30
[signature]	Arcadis	2/22/2021	[signature]	ETA	2/22/21 10:05
[signature]	ETA	2/22/21 11:19	[signature]	TA	2-23-21 920

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :** 144750
Canton Facility

Client Arcadis Site Name

Cooler Received on 2-23-21 Opened on 2-23-21

Cooler unpacked by:

FedEx: 1st (Grd) Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2-5 °C Corrected Cooler Temp. 2-6 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC907861
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #	Yes	No
17. Was a LL Hg or Me Hg trip blank present?	Yes	No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM Date by via Verbal Voice Mail Other

Concerning

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) were received after the recommended holding time had expired.
Sample(s) were received in a broken container.
Sample(s) were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) were further preserved in the laboratory.
Time preserved: Preservative(s) added/Lot number(s):

VOA Sample Preservation - Date/Time VOAs Frozen:

DATA VERIFICATION REPORT

March 09, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144750-1
Sample date: 2021-02-19
Report received by CADENA: 2021-03-09
Initial Data Verification completed by CADENA: 2021-03-09
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144750-1

		Sample Name:	TRIP BLANK				MW-134S_021921			
		Lab Sample ID:	2401447501				2401447502			
		Sample Date:	2/19/2021				2/19/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

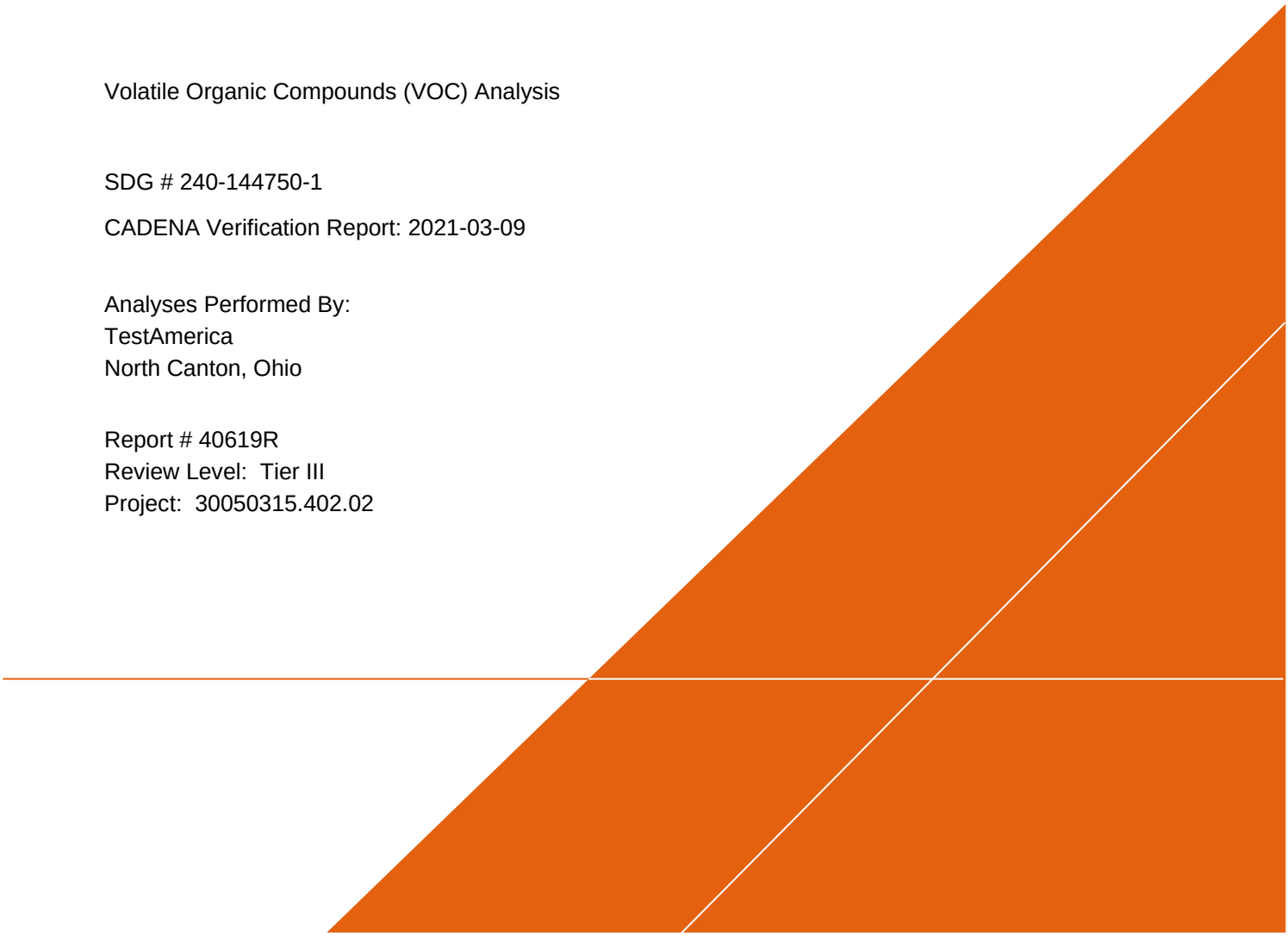
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144750-1

CADENA Verification Report: 2021-03-09

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40619R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144750-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144750-1	Water	02/19/2021		X	
MW-134S_021921	240-144750-2	Water	02/19/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

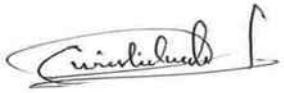
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 18, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 18, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN TestAmerica 190 — THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton -- 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

TestAmerica Laboratories, Inc.

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		
Phone: 248-994-2240	Sampler Name: Allyson Hartz	TAT if different from below: 10 day; ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		For lab use only: Walk-in client; Lab sampling; Job/SDG No:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			
Project Number: 30050315.402.04				
PO # 30050315.402.04	Shipping/Tracking No:			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 trip blank
MW-1345_021921	2/19/21	11:55		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260B SIM

240-144750 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	2/19/21 14:30	Nat cold storage	Arcadis	2/19/21 14:30
[signature]	Arcadis	2/22/2021	[signature]	ETA	2/22/21 10:05
[signature]	ETA	2/22/21 11:19	[signature]	TA	2-23-21 920

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144750-1
Date Collected: 02/19/21 00:00
Matrix: Water
Date Received: 02/23/21 09:20

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 15:35	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 15:35	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 15:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 15:35	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 15:35	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 15:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*75 - 130*		*03/01/21 15:35*	*1*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*		*03/01/21 15:35*	*1*
Toluene-d8 (Surr)	*90*		*69 - 122*		*03/01/21 15:35*	*1*
Dibromofluoromethane (Surr)	*110*		*78 - 129*		*03/01/21 15:35*	*1*

Client Sample ID: MW-134S_021921
Lab Sample ID: 240-144750-2
Date Collected: 02/19/21 11:55
Matrix: Water
Date Received: 02/23/21 09:20

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/26/21 16:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*		*02/26/21 16:44*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 16:00	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/01/21 16:00	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/01/21 16:00	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/01/21 16:00	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/01/21 16:00	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/01/21 16:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*75 - 130*		*03/01/21 16:00*	*1*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*		*03/01/21 16:00*	*1*
Toluene-d8 (Surr)	*91*		*69 - 122*		*03/01/21 16:00*	*1*
Dibromofluoromethane (Surr)	*108*		*78 - 129*		*03/01/21 16:00*	*1*

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144437-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
2/24/2021 11:23:13 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
Review your project results through TotalAccess
Have a Question? Ask The Expert
Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144437-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144437-1

Job ID: 240-144437-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144437-1

Comments
No additional comments.

Receipt
The samples were received on 2/12/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.4º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144437-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144437-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144437-1	TRIP BLANK	Water	02/10/21 00:00	02/12/21 08:00	
240-144437-2	MW-138S_021021	Water	02/10/21 10:31	02/12/21 08:00	
240-144437-3	DUP-12	Water	02/10/21 00:00	02/12/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144437-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144437-1

No Detections.

Client Sample ID: MW-138S_021021 — Lab Sample ID: 240-144437-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	1.3		1.0	0.20	ug/L	1		8260B	Total/NA

Client Sample ID: DUP-12 — Lab Sample ID: 240-144437-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	1.3		1.0	0.20	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144437-1

Client Sample ID: TRIP BLANK
Date Collected: 02/10/21 00:00
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144437-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 16:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 16:24	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 16:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 16:24	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 16:24	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 16:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*75 - 130*		*02/17/21 16:24*	*1*
4-Bromofluorobenzene (Surr)	*86*		*47 - 134*		*02/17/21 16:24*	*1*
Toluene-d8 (Surr)	*98*		*69 - 122*		*02/17/21 16:24*	*1*
Dibromofluoromethane (Surr)	*96*		*78 - 129*		*02/17/21 16:24*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144437-1

Client Sample ID: MW-138S_021021
Date Collected: 02/10/21 10:31
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144437-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/17/21 13:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/17/21 13:46*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 16:47	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 16:47	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 16:47	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 16:47	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 16:47	1
Vinyl chloride	**1.3**		1.0	0.20	ug/L			02/17/21 16:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*		*02/17/21 16:47*	*1*
4-Bromofluorobenzene (Surr)	*92*		*47 - 134*		*02/17/21 16:47*	*1*
Toluene-d8 (Surr)	*103*		*69 - 122*		*02/17/21 16:47*	*1*
Dibromofluoromethane (Surr)	*96*		*78 - 129*		*02/17/21 16:47*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144437-1

Client Sample ID: DUP-12

Date Collected: 02/10/21 00:00
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144437-3

Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/17/21 14:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/17/21 14:11*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 17:09	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 17:09	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 17:09	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 17:09	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 17:09	1
Vinyl chloride	**1.3**		1.0	0.20	ug/L			02/17/21 17:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*		*02/17/21 17:09*	*1*
4-Bromofluorobenzene (Surr)	*82*		*47 - 134*		*02/17/21 17:09*	*1*
Toluene-d8 (Surr)	*91*		*69 - 122*		*02/17/21 17:09*	*1*
Dibromofluoromethane (Surr)	*93*		*78 - 129*		*02/17/21 17:09*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144437-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144437-1	TRIP BLANK	94	86	98	96
240-144437-2	MW-138S_021021	92	92	103	96
240-144437-3	DUP-12	92	82	91	93
240-144438-B-2 MS	Matrix Spike	90	89	97	96
240-144438-B-2 MSD	Matrix Spike Duplicate	87	83	92	90
LCS 240-473375/4	Lab Control Sample	93	96	100	98
MB 240-473375/6	Method Blank	99	96	104	99

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144437-2	MW-138S_021021	83
240-144437-3	DUP-12	82
240-144439-A-3 MS	Matrix Spike	84
240-144439-A-3 MSD	Matrix Spike Duplicate	85
LCS 240-473381/4	Lab Control Sample	80
MB 240-473381/5	Method Blank	81

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473375/6
Matrix: Water
Analysis Batch: 473375

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 09:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 09:44	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 09:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 09:44	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 09:44	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 09:44	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*75 - 130*		*02/17/21 09:44*	*1*
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*		*02/17/21 09:44*	*1*
Toluene-d8 (Surr)	*104*		*69 - 122*		*02/17/21 09:44*	*1*
Dibromofluoromethane (Surr)	*99*		*78 - 129*		*02/17/21 09:44*	*1*

Lab Sample ID: LCS 240-473375/4
Matrix: Water
Analysis Batch: 473375

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.85		ug/L		98	73 - 129
cis-1,2-Dichloroethene	10.0	9.66		ug/L		97	75 - 124
Tetrachloroethene	10.0	10.4		ug/L		104	70 - 125
trans-1,2-Dichloroethene	10.0	9.74		ug/L		97	74 - 130
Trichloroethene	10.0	9.92		ug/L		99	71 - 121
Vinyl chloride	10.0	10.2		ug/L		102	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*96*		*47 - 134*
Toluene-d8 (Surr)	*100*		*69 - 122*
Dibromofluoromethane (Surr)	*98*		*78 - 129*

Lab Sample ID: 240-144438-B-2 MS
Matrix: Water
Analysis Batch: 473375

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1000	U	10000	8730		ug/L		87	64 - 132
cis-1,2-Dichloroethene	21000	F1	10000	26900	F1	ug/L		63	68 - 121
Tetrachloroethene	870	J	10000	9300		ug/L		84	52 - 129
trans-1,2-Dichloroethene	200	J	10000	8950		ug/L		87	69 - 126
Trichloroethene	6700		10000	14700		ug/L		80	56 - 124
Vinyl chloride	1000	U	10000	9030		ug/L		90	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*90*		*75 - 130*
4-Bromofluorobenzene (Surr)	*89*		*47 - 134*
Toluene-d8 (Surr)	*97*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144438-B-2 MS
Matrix: Water
Analysis Batch: 473375

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	*96*		*78 - 129*

Lab Sample ID: 240-144438-B-2 MSD
Matrix: Water
Analysis Batch: 473375

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1000	U	10000	9900		ug/L		99	64 - 132	13	35
cis-1,2-Dichloroethene	21000	F1	10000	29700		ug/L		91	68 - 121	10	35
Tetrachloroethene	870	J	10000	10900		ug/L		101	52 - 129	16	35
trans-1,2-Dichloroethene	200	J	10000	9770		ug/L		96	69 - 126	9	35
Trichloroethene	6700		10000	15400		ug/L		87	56 - 124	5	35
Vinyl chloride	1000	U	10000	9850		ug/L		99	49 - 136	9	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 130*
4-Bromofluorobenzene (Surr)	*83*		*47 - 134*
Toluene-d8 (Surr)	*92*		*69 - 122*
Dibromofluoromethane (Surr)	*90*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473381/5
Matrix: Water
Analysis Batch: 473381

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/17/21 09:33	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/17/21 09:33*	*1*

Lab Sample ID: LCS 240-473381/4
Matrix: Water
Analysis Batch: 473381

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.8		ug/L		108	80 - 135

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*80*		*70 - 133*

Lab Sample ID: 240-144439-A-3 MS
Matrix: Water
Analysis Batch: 473381

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	34		10.0	43.3		ug/L		91	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*84*		*70 - 133*

Lab Sample ID: 240-144439-A-3 MSD
Matrix: Water
Analysis Batch: 473381

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	34		10.0	42.6		ug/L		83	46 - 170	2	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*85*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144437-1

GC/MS VOA

Analysis Batch: 473375

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144437-1	TRIP BLANK	Total/NA	Water	8260B	
240-144437-2	MW-138S_021021	Total/NA	Water	8260B	
240-144437-3	DUP-12	Total/NA	Water	8260B	
MB 240-473375/6	Method Blank	Total/NA	Water	8260B	
LCS 240-473375/4	Lab Control Sample	Total/NA	Water	8260B	
240-144438-B-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144438-B-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 473381

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144437-2	MW-138S_021021	Total/NA	Water	8260B SIM	
240-144437-3	DUP-12	Total/NA	Water	8260B SIM	
MB 240-473381/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-473381/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144439-A-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144439-A-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144437-1

Client Sample ID: TRIP BLANK
Date Collected: 02/10/21 00:00
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144437-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473375	02/17/21 16:24	LEE	TAL CAN

Client Sample ID: MW-138S_021021
Date Collected: 02/10/21 10:31
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144437-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473375	02/17/21 16:47	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	473381	02/17/21 13:46	SAM	TAL CAN

Client Sample ID: DUP-12
Date Collected: 02/10/21 00:00
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144437-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473375	02/17/21 17:09	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	473381	02/17/21 14:11	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144437-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

MICHIGAN 190 — TestAmerica — THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Andrew Banitt	TAT if different from below: 10 day; ☑ 2 weeks; ☐ 3 weeks; ☐ 1 week; ☐ 2 days; ☐ 1 day		Walk-in client; Lab sampling; Job/SDG No:
Phone: 248-994-2240	Method of Shipment/Carrier:			
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	2/10/21	—		1						1					N	G	X	X	X	X	X	X	X	Trip Blanks
MW-1385_021021	2/10/21	1031		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B; 3 VOAs for 8260BSIM
DUP-12	2/10/21	—		6						6					N	G	X	X	X	X	X	X	X	↓



Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalla@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by:	Arcadis	2/10/21 1725	Received by: Novi Cold Storage	Arcadis	2/10/21 1725
Relinquished by:	ARCADIS	2/11/21 0953	Received by:	ETA	2/11/21 0953
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company: ETA	Date/Time: 2-12-21 800

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2/24/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 144437**
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: Ryan C

Cooler Received on 2-12-21 Opened on 2-12-21 800

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other _____

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☑ See Multiple Cooler Form

IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 0.3 °C Corrected Cooler Temp. 0.4 °C

IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 3	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	(Yes)	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	(No)
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No RAC 2-12-21
6. Was/were the person(s) who collected the samples clearly identified on the COC?	(Yes)	No
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No	(NA) pH Strip Lot# HC907861
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 59072	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT



February 24, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144437-1
Sample date: 2021-02-10
Report received by CADENA: 2021-02-24
Initial Data Verification completed by CADENA: 2021-02-24
Number of Samples:3
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch MS/MSD recovery outliers were not determined using a client sample so qualification was not required based on these sample-specific QC outliers.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144437-1

		Sample Name:	TRIP BLANK				MW-138S_021021				DUP-12			
		Lab Sample ID:	2401444371				2401444372				2401444373			
		Sample Date:	2/10/2021				2/10/2021				2/10/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC													
OSW-8260B													
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	1.3	1.0	ug/l	---	1.3	1.0	ug/l	---
OSW-8260BBSim													
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

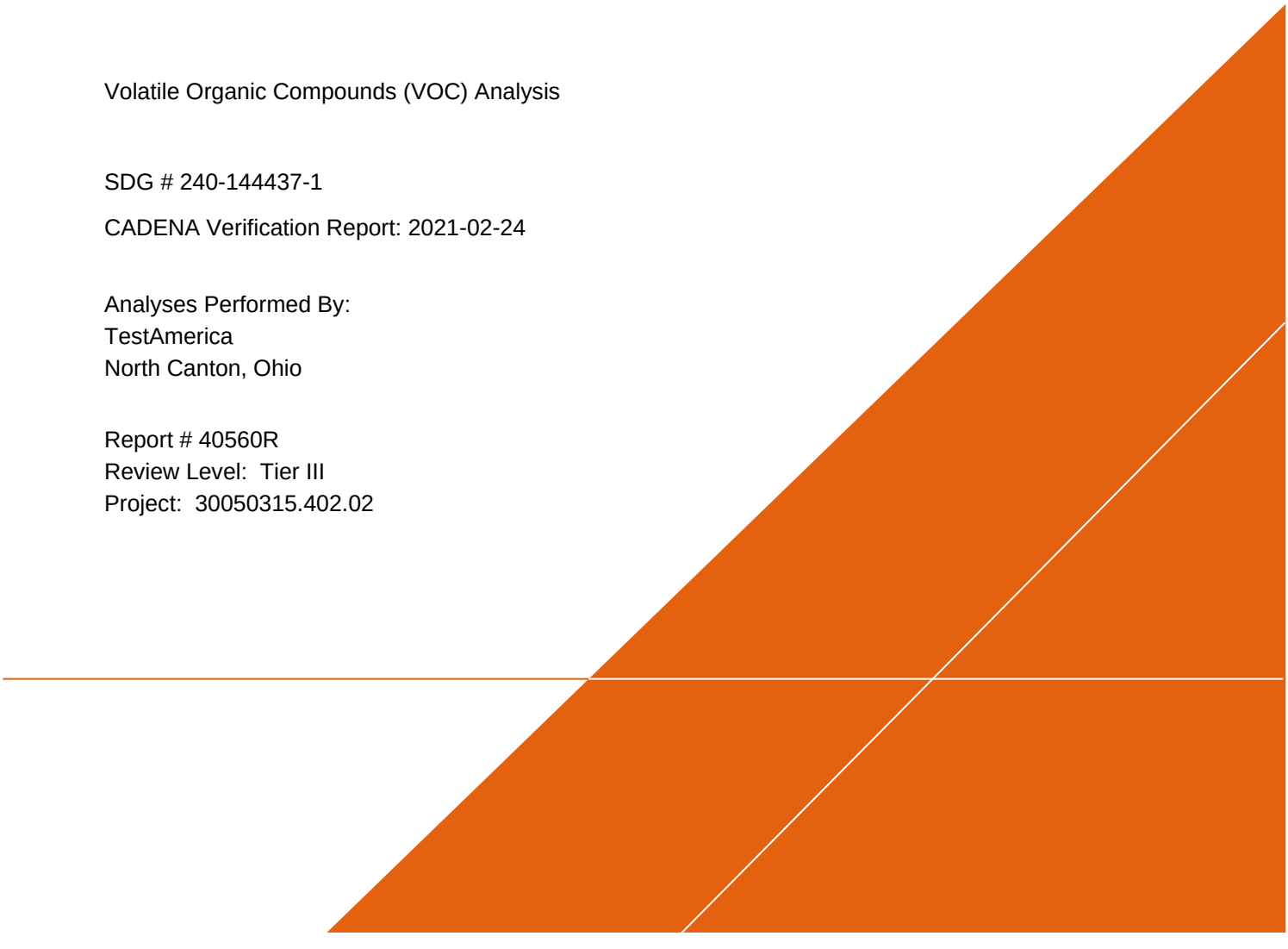
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144437-1

CADENA Verification Report: 2021-02-24

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40560R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144437-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144437-1	Water	02/10/2021		X	
MW-138S_021021	240-144437-2	Water	02/10/2021	MW-80SR_021021	X	X
DUP-12	240-144437-3	Water	02/10/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result (µg/L)	Duplicate Result (µg/L)	RPD
MW-138S_021021 / DUP-12	Vinyl chloride	1.3	1.3	AC

Notes:

AC – Acceptable

The calculated differences between the parent sample and field duplicate were acceptable.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

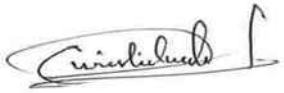
%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 17, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190 — TestAmerica — THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	of COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name: Andrew Banitt	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day — 10 day		Walk-in client
Phone: 248-994-2240	Method of Shipment/Carrier:			Lab sampling
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	2/10/21	—		1						1					N	G	X	X	X	X	X	X	X	Trip Blank
MW-1385_021021	2/10/21	1031		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260BSIM
DUP-12	2/10/21	—		6						6					N	G	X	X	X	X	X	X	X	↓



Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalla@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	Arcadis	2/10/21 1725	Novi cold storage	Arcadis	2/10/21 1725
[signature]	ARCADIS	2/11/21 0953	[signature]	ETA	2/11/21 0953
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
			[signature]	ETA	2-12-21 800

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02/24/2021

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144437-1

Date Collected: 02/10/21 00:00
Matrix: Water
Date Received: 02/12/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 16:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 16:24	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 16:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 16:24	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 16:24	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/17/21 16:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*94*		*75 - 130*		*02/17/21 16:24*	*1*
4-Bromofluorobenzene (Surr)	*86*		*47 - 134*		*02/17/21 16:24*	*1*
Toluene-d8 (Surr)	*98*		*69 - 122*		*02/17/21 16:24*	*1*
Dibromofluoromethane (Surr)	*96*		*78 - 129*		*02/17/21 16:24*	*1*

Client Sample ID: MW-138S_021021

Lab Sample ID: 240-144437-2

Date Collected: 02/10/21 10:31
Matrix: Water
Date Received: 02/12/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/17/21 13:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*		*02/17/21 13:46*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 16:47	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 16:47	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 16:47	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 16:47	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 16:47	1
Vinyl chloride	**1.3**		1.0	0.20	ug/L			02/17/21 16:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*		*02/17/21 16:47*	*1*
4-Bromofluorobenzene (Surr)	*92*		*47 - 134*		*02/17/21 16:47*	*1*
Toluene-d8 (Surr)	*103*		*69 - 122*		*02/17/21 16:47*	*1*
Dibromofluoromethane (Surr)	*96*		*78 - 129*		*02/17/21 16:47*	*1*

Client Sample ID: DUP-12

Lab Sample ID: 240-144437-3

Date Collected: 02/10/21 00:00
Matrix: Water
Date Received: 02/12/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/17/21 14:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/17/21 14:11*	*1*

Client Sample ID: DUP-12
Date Collected: 02/10/21 00:00
Date Received: 02/12/21 08:00

Lab Sample ID: 240-144437-3
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 17:09	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/17/21 17:09	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/17/21 17:09	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/17/21 17:09	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/17/21 17:09	1
Vinyl chloride	**1.3**		1.0	0.20	ug/L			02/17/21 17:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*92*		*75 - 130*		*02/17/21 17:09*	*1*
4-Bromofluorobenzene (Surr)	*82*		*47 - 134*		*02/17/21 17:09*	*1*
Toluene-d8 (Surr)	*91*		*69 - 122*		*02/17/21 17:09*	*1*
Dibromofluoromethane (Surr)	*93*		*78 - 129*		*02/17/21 17:09*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144667-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
3/5/2021 2:31:05 PM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144667-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144667-1

Job ID: 240-144667-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144667-1

Comments
No additional comments.

Receipt
The samples were received on 2/19/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.4º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144667-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144667-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144667-1	TRIP BLANK	Water	02/15/21 00:00	02/19/21 08:00	
240-144667-2	MW-141S_021521	Water	02/15/21 12:11	02/19/21 08:00	
240-144667-3	MW-140S_021521	Water	02/15/21 14:31	02/19/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144667-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144667-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Trichloroethene	0.15	J	1.0	0.10	ug/L	1		8260B	Total/NA

Client Sample ID: MW-141S_021521 — Lab Sample ID: 240-144667-2

No Detections.

Client Sample ID: MW-140S_021521 — Lab Sample ID: 240-144667-3

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144667-1

Client Sample ID: TRIP BLANK
Date Collected: 02/15/21 00:00
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144667-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 20:45	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 20:45	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 20:45	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 20:45	1
Trichloroethene	**0.15**	**J**	1.0	0.10	ug/L			02/24/21 20:45	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 20:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*90*		*75 - 130*		*02/24/21 20:45*	*1*
4-Bromofluorobenzene (Surr)	*100*		*47 - 134*		*02/24/21 20:45*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*02/24/21 20:45*	*1*
Dibromofluoromethane (Surr)	*88*		*78 - 129*		*02/24/21 20:45*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144667-1

Client Sample ID: MW-141S_021521
Date Collected: 02/15/21 12:11
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144667-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/24/21 20:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/24/21 20:42*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 21:10	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 21:10	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 21:10	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 21:10	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 21:10	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 21:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*		*02/24/21 21:10*	*1*
4-Bromofluorobenzene (Surr)	*100*		*47 - 134*		*02/24/21 21:10*	*1*
Toluene-d8 (Surr)	*97*		*69 - 122*		*02/24/21 21:10*	*1*
Dibromofluoromethane (Surr)	*89*		*78 - 129*		*02/24/21 21:10*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144667-1

Client Sample ID: MW-140S_021521
Date Collected: 02/15/21 14:31
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144667-3
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/24/21 21:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/24/21 21:08*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 21:35	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 21:35	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 21:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 21:35	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 21:35	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 21:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*75 - 130*		*02/24/21 21:35*	*1*
4-Bromofluorobenzene (Surr)	*99*		*47 - 134*		*02/24/21 21:35*	*1*
Toluene-d8 (Surr)	*95*		*69 - 122*		*02/24/21 21:35*	*1*
Dibromofluoromethane (Surr)	*90*		*78 - 129*		*02/24/21 21:35*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144667-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144568-D-2 MS	Matrix Spike	87	98	93	89
240-144568-E-2 MSD	Matrix Spike Duplicate	86	100	92	91
240-144667-1	TRIP BLANK	90	100	93	88
240-144667-2	MW-141S_021521	86	100	97	89
240-144667-3	MW-140S_021521	89	99	95	90
LCS 240-474307/4	Lab Control Sample	84	101	92	89
MB 240-474307/7	Method Blank	87	103	92	89

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144568-J-2 MS	Matrix Spike	81
240-144568-J-2 MSD	Matrix Spike Duplicate	82
240-144667-2	MW-141S_021521	81
240-144667-3	MW-140S_021521	82
LCS 240-474283/4	Lab Control Sample	84
MB 240-474283/5	Method Blank	86

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474307/7
Matrix: Water
Analysis Batch: 474307

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 14:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 14:06	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 14:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 14:06	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 14:06	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 14:06	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 130*		*02/24/21 14:06*	*1*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*		*02/24/21 14:06*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*02/24/21 14:06*	*1*
Dibromofluoromethane (Surr)	*89*		*78 - 129*		*02/24/21 14:06*	*1*

Lab Sample ID: LCS 240-474307/4
Matrix: Water
Analysis Batch: 474307

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.71		ug/L		97	73 - 129
cis-1,2-Dichloroethene	10.0	10.6		ug/L		106	75 - 124
Tetrachloroethene	10.0	9.87		ug/L		99	70 - 125
trans-1,2-Dichloroethene	10.0	10.3		ug/L		103	74 - 130
Trichloroethene	10.0	9.93		ug/L		99	71 - 121
Vinyl chloride	10.0	11.5		ug/L		115	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*
4-Bromofluorobenzene (Surr)	*101*		*47 - 134*
Toluene-d8 (Surr)	*92*		*69 - 122*
Dibromofluoromethane (Surr)	*89*		*78 - 129*

Lab Sample ID: 240-144568-D-2 MS
Matrix: Water
Analysis Batch: 474307

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.77		ug/L		98	64 - 132
cis-1,2-Dichloroethene	0.43	J	10.0	10.1		ug/L		97	68 - 121
Tetrachloroethene	1.0	U	10.0	9.57		ug/L		96	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.78		ug/L		98	69 - 126
Trichloroethene	1.0	U	10.0	9.70		ug/L		97	56 - 124
Vinyl chloride	1.0	U	10.0	11.4		ug/L		114	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 130*
4-Bromofluorobenzene (Surr)	*98*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144568-D-2 MS
Matrix: Water
Analysis Batch: 474307

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	89		78 - 129

Lab Sample ID: 240-144568-E-2 MSD
Matrix: Water
Analysis Batch: 474307

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.63		ug/L		96	64 - 132	1	35
cis-1,2-Dichloroethene	0.43	J	10.0	10.2		ug/L		98	68 - 121	1	35
Tetrachloroethene	1.0	U	10.0	8.84		ug/L		88	52 - 129	8	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.59		ug/L		96	69 - 126	2	35
Trichloroethene	1.0	U	10.0	9.53		ug/L		95	56 - 124	2	35
Vinyl chloride	1.0	U	10.0	11.7		ug/L		117	49 - 136	2	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	86		75 - 130
4-Bromofluorobenzene (Surr)	100		47 - 134
Toluene-d8 (Surr)	92		69 - 122
Dibromofluoromethane (Surr)	91		78 - 129

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-474283/5
Matrix: Water
Analysis Batch: 474283

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/24/21 11:01	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	86		70 - 133		02/24/21 11:01	1

Lab Sample ID: LCS 240-474283/4
Matrix: Water
Analysis Batch: 474283

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	10.5		ug/L		105	80 - 135

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	84		70 - 133

Lab Sample ID: 240-144568-J-2 MS
Matrix: Water
Analysis Batch: 474283

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	9.90		ug/L		99	46 - 170

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*

Lab Sample ID: 240-144568-J-2 MSD
Matrix: Water
Analysis Batch: 474283

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.89		ug/L		99	46 - 170	0	26

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144667-1

GC/MS VOA

Analysis Batch: 474283

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144667-2	MW-141S_021521	Total/NA	Water	8260B SIM	
240-144667-3	MW-140S_021521	Total/NA	Water	8260B SIM	
MB 240-474283/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474283/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144568-J-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144568-J-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474307

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144667-1	TRIP BLANK	Total/NA	Water	8260B	
240-144667-2	MW-141S_021521	Total/NA	Water	8260B	
240-144667-3	MW-140S_021521	Total/NA	Water	8260B	
MB 240-474307/7	Method Blank	Total/NA	Water	8260B	
LCS 240-474307/4	Lab Control Sample	Total/NA	Water	8260B	
240-144568-D-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144568-E-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144667-1

Client Sample ID: TRIP BLANK
Date Collected: 02/15/21 00:00
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144667-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474307	02/24/21 20:45	LRW	TAL CAN

Client Sample ID: MW-141S_021521
Date Collected: 02/15/21 12:11
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144667-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474307	02/24/21 21:10	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474283	02/24/21 20:42	SAM	TAL CAN

Client Sample ID: MW-140S_021521
Date Collected: 02/15/21 14:31
Date Received: 02/19/21 08:00

Lab Sample ID: 240-144667-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474307	02/24/21 21:35	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474283	02/24/21 21:08	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144667-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No: / of 1 COCs
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day — 10 day	For lab use only: Walk-in client; Lab sampling; Job/SDG No:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/15/21	—		X						1							X	X	X	X	X	X	X	1 trip blank
MW-1415-021521	02/15/21	12:11		X						6					N	G	X	X	X	X	X	X	X	Method 8260B - 3 VOAs Method 8260B SIM - 3 VOAs
MW-1405-021521	02/15/21	14:31		X						6					N	G	X	X	X	X	X	X	X	6

240-144667 Chain of Custody

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Gary Schafer	Arcadis	2/17/21 1715	Novi cold Storage	Arcadis	02/17/21 1715
Julia McClafferty	Arcadis	2/18/2021	Amanda Battenhill	ETA	2/18/21 1018
Amanda Battenhill	ETA	2/18/21 11:38	Received in Laboratory by:	Company: TA	Date/Time: 2-19-21 800

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3/5/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 144647

Client Arcadis Site Name _____

Cooler Received on 2-19-21 Opened on 2-19-21

Cooler unpacked by:

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 1.3 °C Corrected Cooler Temp. 1.4 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	Yes	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	No
-Were tamper/custody seals intact and uncompromised?	Yes	No NA
3. Shippers' packing slip attached to the cooler(s)?	Yes	No
4. Did custody papers accompany the sample(s)?	Yes	No
5. Were the custody papers relinquished & signed in the appropriate place?	Yes	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	No
7. Did all bottles arrive in good condition (Unbroken)?	Yes	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	Yes	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated?	Yes	No
11. Sufficient quantity received to perform indicated analyses?	Yes	No
12. Are these work share samples and all listed on the COC?	Yes	No
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No NA pH Strip Lot# HC907861
14. Were VOAs on the COC?	Yes	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	No NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____	Yes	No
17. Was a LL Hg or Me Hg trip blank present? _____	Yes	No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

March 05, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144667-1
Sample date: 2021-02-15
Report received by CADENA: 2021-03-05
Initial Data Verification completed by CADENA: 2021-03-05
Number of Samples:3
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC TRIP blank had a detection below the RL for the following analyte: TRICHLOROETHENE. Qualification of client sample results was not required based on these TRIP blank detections.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144667-1

		Sample Name:	TRIP BLANK				MW-141S_021521				MW-140S_021521			
		Lab Sample ID:	2401446671				2401446672				2401446673			
		Sample Date:	2/15/2021				2/15/2021				2/15/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC													
OSW-8260B													
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	0.15	1.0	ug/l	J	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim													
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---

ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

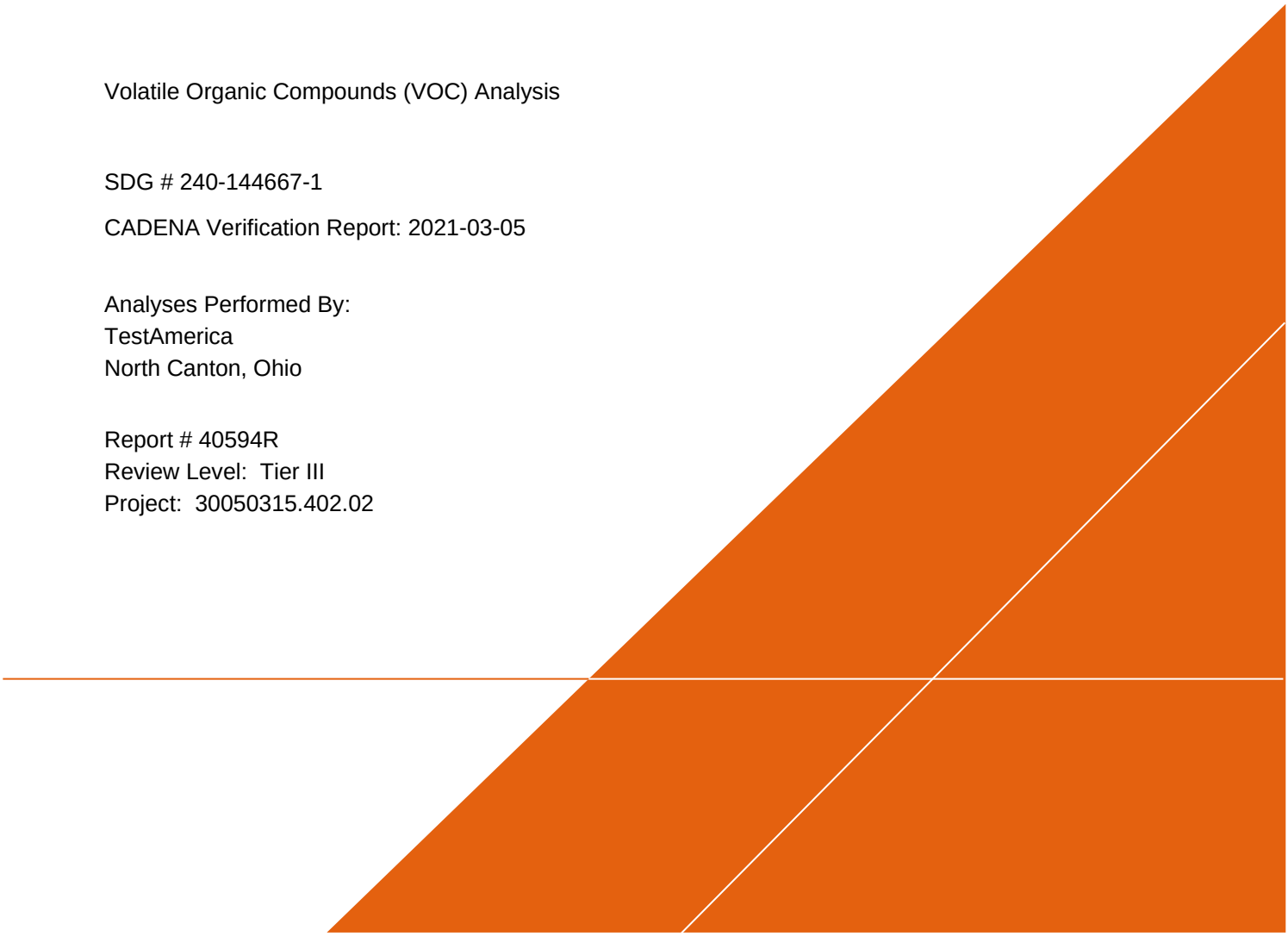
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144667-1

CADENA Verification Report: 2021-03-05

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40594R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144667-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144667-1	Water	02/15/2021		X	
MW-141S_021521	240-144667-2	Water	02/15/2021		X	X
MW-140S_021521	240-144667-3	Water	02/15/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

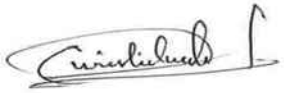
%R Percent recovery

RPD Relative percent difference

%D Percent difference

DATA REVIEW

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 17, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 18, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

MICHIGAN 190

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	COC No: / of 1 COCs
Phone: 248-994-2240	Sampler Name: Gary Schafer	TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day (10 day)	For lab use only: Walk-in client; Lab sampling; Job/SDG No:
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK	02/15/21	--		X						1							X	X	X	X	X	X	X	1 trip blank
MW-1415-021521	02/15/21	12:11		X						6					N	G	X	X	X	X	X	X	X	Method 8260B - 3 VOAs Method 8260B SIM - 3 VOAs
MW-1405-021521	02/15/21	14:31		X						6					N	G	X	X	X	X	X	X	X	6

240-144667 Chain of Custody

Possible Hazard Identification: ✓ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company	Date/Time		Company	Date/Time
Relinquished by: Gary Schafer	Arcadis	2/17/21	1715	Received by: Novi cold Storage	Arcadis 02/17/21 1715
Relinquished by: Julia McClafferty	Arcadis	2/18/2021		Received by: Amanda Battenhill	ETA 2/18/21 1018
Relinquished by: Amanda Battenhill	ETA	2/18/21	11:58	Received in Laboratory by:	TA 2-19-21 800

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Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144667-1
Date Collected: 02/15/21 00:00
Matrix: Water
Date Received: 02/19/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 20:45	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 20:45	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 20:45	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 20:45	1
Trichloroethene	**0.15**	**J**	1.0	0.10	ug/L			02/24/21 20:45	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 20:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*90*		*75 - 130*		*02/24/21 20:45*	*1*
4-Bromofluorobenzene (Surr)	*100*		*47 - 134*		*02/24/21 20:45*	*1*
Toluene-d8 (Surr)	*93*		*69 - 122*		*02/24/21 20:45*	*1*
Dibromofluoromethane (Surr)	*88*		*78 - 129*		*02/24/21 20:45*	*1*

Client Sample ID: MW-141S_021521
Lab Sample ID: 240-144667-2
Date Collected: 02/15/21 12:11
Matrix: Water
Date Received: 02/19/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/24/21 20:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*81*		*70 - 133*		*02/24/21 20:42*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 21:10	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 21:10	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 21:10	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 21:10	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 21:10	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 21:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*		*02/24/21 21:10*	*1*
4-Bromofluorobenzene (Surr)	*100*		*47 - 134*		*02/24/21 21:10*	*1*
Toluene-d8 (Surr)	*97*		*69 - 122*		*02/24/21 21:10*	*1*
Dibromofluoromethane (Surr)	*89*		*78 - 129*		*02/24/21 21:10*	*1*

Client Sample ID: MW-140S_021521
Lab Sample ID: 240-144667-3
Date Collected: 02/15/21 14:31
Matrix: Water
Date Received: 02/19/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/24/21 21:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/24/21 21:08*	*1*

Client Sample ID: MW-140S_021521
Lab Sample ID: 240-144667-3
Date Collected: 02/15/21 14:31
Matrix: Water
Date Received: 02/19/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 21:35	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 21:35	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 21:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 21:35	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 21:35	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 21:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*75 - 130*		*02/24/21 21:35*	*1*
4-Bromofluorobenzene (Surr)	*99*		*47 - 134*		*02/24/21 21:35*	*1*
Toluene-d8 (Surr)	*95*		*69 - 122*		*02/24/21 21:35*	*1*
Dibromofluoromethane (Surr)	*90*		*78 - 129*		*02/24/21 21:35*	*1*

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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144364-1
Client Project/Site: Ford LTP - Off Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey

Authorized for release by:
2/17/2021 10:32:06 AM

Michael DelMonico, Project Manager I
(330)497-9396
Michael.DelMonico@Eurofinset.com

LINKS
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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144364-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144364-1

Job ID: 240-144364-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144364-1

Comments
No additional comments.

Receipt
The samples were received on 2/11/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.2º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144364-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144364-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144364-1	TRIP BLANK	Water	02/09/21 00:00	02/11/21 08:00	
240-144364-2	MW-192S_020921	Water	02/09/21 15:25	02/11/21 08:00	

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144364-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144364-1

No Detections.

Client Sample ID: MW-192S_020921 — Lab Sample ID: 240-144364-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	0.20	J	1.0	0.16	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144364-1

Client Sample ID: TRIP BLANK
Date Collected: 02/09/21 00:00
Date Received: 02/11/21 08:00

Lab Sample ID: 240-144364-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 17:36	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 17:36	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 17:36	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 17:36	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 17:36	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 17:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*		*02/15/21 17:36*	*1*
4-Bromofluorobenzene (Surr)	*93*		*47 - 134*		*02/15/21 17:36*	*1*
Toluene-d8 (Surr)	*100*		*69 - 122*		*02/15/21 17:36*	*1*
Dibromofluoromethane (Surr)	*100*		*78 - 129*		*02/15/21 17:36*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144364-1

Client Sample ID: MW-192S_020921
Date Collected: 02/09/21 15:25
Date Received: 02/11/21 08:00

Lab Sample ID: 240-144364-2
Matrix: Water

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 17:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/12/21 17:57*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 17:58	1
cis-1,2-Dichloroethene	**0.20**	**J**	1.0	0.16	ug/L			02/15/21 17:58	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 17:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 17:58	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 17:58	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 17:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 130*		*02/15/21 17:58*	*1*
4-Bromofluorobenzene (Surr)	*90*		*47 - 134*		*02/15/21 17:58*	*1*
Toluene-d8 (Surr)	*99*		*69 - 122*		*02/15/21 17:58*	*1*
Dibromofluoromethane (Surr)	*101*		*78 - 129*		*02/15/21 17:58*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144364-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144277-B-2 MS	Matrix Spike	91	95	105	99
240-144277-B-2 MSD	Matrix Spike Duplicate	93	90	99	99
240-144364-1	TRIP BLANK	97	93	100	100
240-144364-2	MW-192S_020921	98	90	99	101
LCS 240-473047/4	Lab Control Sample	99	102	106	104
MB 240-473047/6	Method Blank	86	81	92	93

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
TOL = Toluene-d8 (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144364-2	MW-192S_020921	82
240-144376-F-3 MS	Matrix Spike	83
240-144376-F-3 MSD	Matrix Spike Duplicate	82
LCS 240-472900/4	Lab Control Sample	82
MB 240-472900/5	Method Blank	82

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-473047/6
Matrix: Water
Analysis Batch: 473047

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 10:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 10:57	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 10:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 10:57	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 10:57	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 10:57	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*		*02/15/21 10:57*	*1*
4-Bromofluorobenzene (Surr)	*81*		*47 - 134*		*02/15/21 10:57*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*02/15/21 10:57*	*1*
Dibromofluoromethane (Surr)	*93*		*78 - 129*		*02/15/21 10:57*	*1*

Lab Sample ID: LCS 240-473047/4
Matrix: Water
Analysis Batch: 473047

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	11.1		ug/L		111	73 - 129
cis-1,2-Dichloroethene	10.0	10.6		ug/L		106	75 - 124
Tetrachloroethene	10.0	11.4		ug/L		114	70 - 125
trans-1,2-Dichloroethene	10.0	10.4		ug/L		104	74 - 130
Trichloroethene	10.0	10.4		ug/L		104	71 - 121
Vinyl chloride	10.0	9.92		ug/L		99	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*99*		*75 - 130*
4-Bromofluorobenzene (Surr)	*102*		*47 - 134*
Toluene-d8 (Surr)	*106*		*69 - 122*
Dibromofluoromethane (Surr)	*104*		*78 - 129*

Lab Sample ID: 240-144277-B-2 MS
Matrix: Water
Analysis Batch: 473047

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	67	U	667	598		ug/L		90	64 - 132
cis-1,2-Dichloroethene	1500		667	2140		ug/L		102	68 - 121
Tetrachloroethene	56	J	667	634		ug/L		87	52 - 129
Trichloroethene	1100		667	1670		ug/L		91	56 - 124
Vinyl chloride	160		667	734		ug/L		86	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*91*		*75 - 130*
4-Bromofluorobenzene (Surr)	*95*		*47 - 134*
Toluene-d8 (Surr)	*105*		*69 - 122*
Dibromofluoromethane (Surr)	*99*		*78 - 129*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144277-B-2 MSD
Matrix: Water
Analysis Batch: 473047

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	67	U	667	668		ug/L		100	64 - 132	11	35
cis-1,2-Dichloroethene	1500		667	2220		ug/L		113	68 - 121	3	35
Tetrachloroethene	56	J	667	730		ug/L		101	52 - 129	14	35
Trichloroethene	1100		667	1740		ug/L		101	56 - 124	4	35
Vinyl chloride	160		667	774		ug/L		92	49 - 136	5	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*93*		*75 - 130*
4-Bromofluorobenzene (Surr)	*90*		*47 - 134*
Toluene-d8 (Surr)	*99*		*69 - 122*
Dibromofluoromethane (Surr)	*99*		*78 - 129*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-472900/5
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 12:29	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/12/21 12:29*	*1*

Lab Sample ID: LCS 240-472900/4
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.6		ug/L		106	80 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

Lab Sample ID: 240-144376-F-3 MS
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	10.8		ug/L		108	46 - 170		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*83*		*70 - 133*

Method: 8260B SIM - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 240-144376-F-3 MSD
Matrix: Water
Analysis Batch: 472900

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	10.8		ug/L		108	46 - 170	1	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144364-1

GC/MS VOA

Analysis Batch: 472900

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144364-2	MW-192S_020921	Total/NA	Water	8260B SIM	
MB 240-472900/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-472900/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144376-F-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144376-F-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 473047

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144364-1	TRIP BLANK	Total/NA	Water	8260B	
240-144364-2	MW-192S_020921	Total/NA	Water	8260B	
MB 240-473047/6	Method Blank	Total/NA	Water	8260B	
LCS 240-473047/4	Lab Control Sample	Total/NA	Water	8260B	
240-144277-B-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144277-B-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144364-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144364-1

Date Collected: 02/09/21 00:00

Matrix: Water

Date Received: 02/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473047	02/15/21 17:36	LEE	TAL CAN

Client Sample ID: MW-192S_020921

Lab Sample ID: 240-144364-2

Date Collected: 02/09/21 15:25

Matrix: Water

Date Received: 02/11/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473047	02/15/21 17:58	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	472900	02/12/21 17:57	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144364-1

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

Chain of Custody Record

TestAmerica

MICHIGAN 190

THE LEADER IN ENVIRONMENTAL TESTING

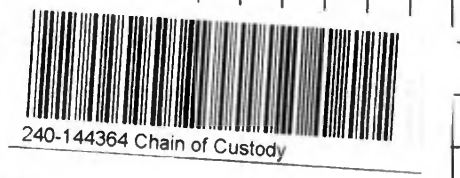
TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time		For lab use only
Phone: 248-994-2240	Sampler Name:	TAT if different from below: 10 day; ☑ 2 weeks; ☐ 3 weeks; ☐ 1 week; ☐ 2 days; ☐ 1 day		Walk-in client
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:			Lab sampling
Project Number: 30050315.402.04	Shipping/Tracking No:			Job/SDG No:
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	Analyses: 1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK		-		1						1					N	G	X	X	X	X	X	X	X	Trip Blank
MW-1925-020921	2/9/21	1525		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260BSIM



Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Cadena	Arcadis	2/9/21 1810	Novi cold storage	Arcadis	2/9/21 1810
Julia McClafferty	Arcadis	2/10/2021	Amanda Battaglia	ETA	2/10/21 1012
Amanda Battaglia	ETA	2/10/21 1307		Company: ETA	Date/Time: 2-11-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 144364

Client Arcadis Site Name

Cooler unpacked by: Matt Snyder

Cooler Received on 2-11-21 Opened on 2-11-21

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # VA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 2.1 °C Corrected Cooler Temp. 2.2 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes)	No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes	No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes	(No)
-Were tamper/custody seals intact and uncompromised?	(Yes)	No NA
3. Shippers' packing slip attached to the cooler(s)?	(Yes)	No
4. Did custody papers accompany the sample(s)?	(Yes)	No
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes)	No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes	(No)
7. Did all bottles arrive in good condition (Unbroken)?	(Yes)	No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes)	No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp(Y/N)?	(Y)	(N)
10. Were correct bottle(s) used for the test(s) indicated?	(Yes)	No
11. Sufficient quantity received to perform indicated analyses?	(Yes)	No
12. Are these work share samples and all listed on the COC?	Yes	(No)
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes	No (NA) pH Strip Lot# HC907861
14. Were VOAs on the COC?	(Yes)	No
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes	(No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 011701E	(Yes)	No
17. Was a LL Hg or Me Hg trip blank present?	Yes	(No)

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES ☐ additional next page

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

DATA VERIFICATION REPORT



February 17, 2021

Kris Hinskey
Arcadis Inc
10559 Citation Ave
Suite 100
Brighton, MI 48116

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144364-1
Sample date: 2021-02-09
Report received by CADENA: 2021-02-17
Initial Data Verification completed by CADENA: 2021-02-17
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

There were no significant QC anomalies or exceptions to report.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at http://clms.cadenaco.com/index.cfm.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144364-1

		Sample Name:	TRIP BLANK				MW-192S_020921			
		Lab Sample ID:	2401443641				2401443642			
		Sample Date:	2/9/2021				2/9/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	0.20	1.0	ug/l	J
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS Design & Consultancy for natural and built assets

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

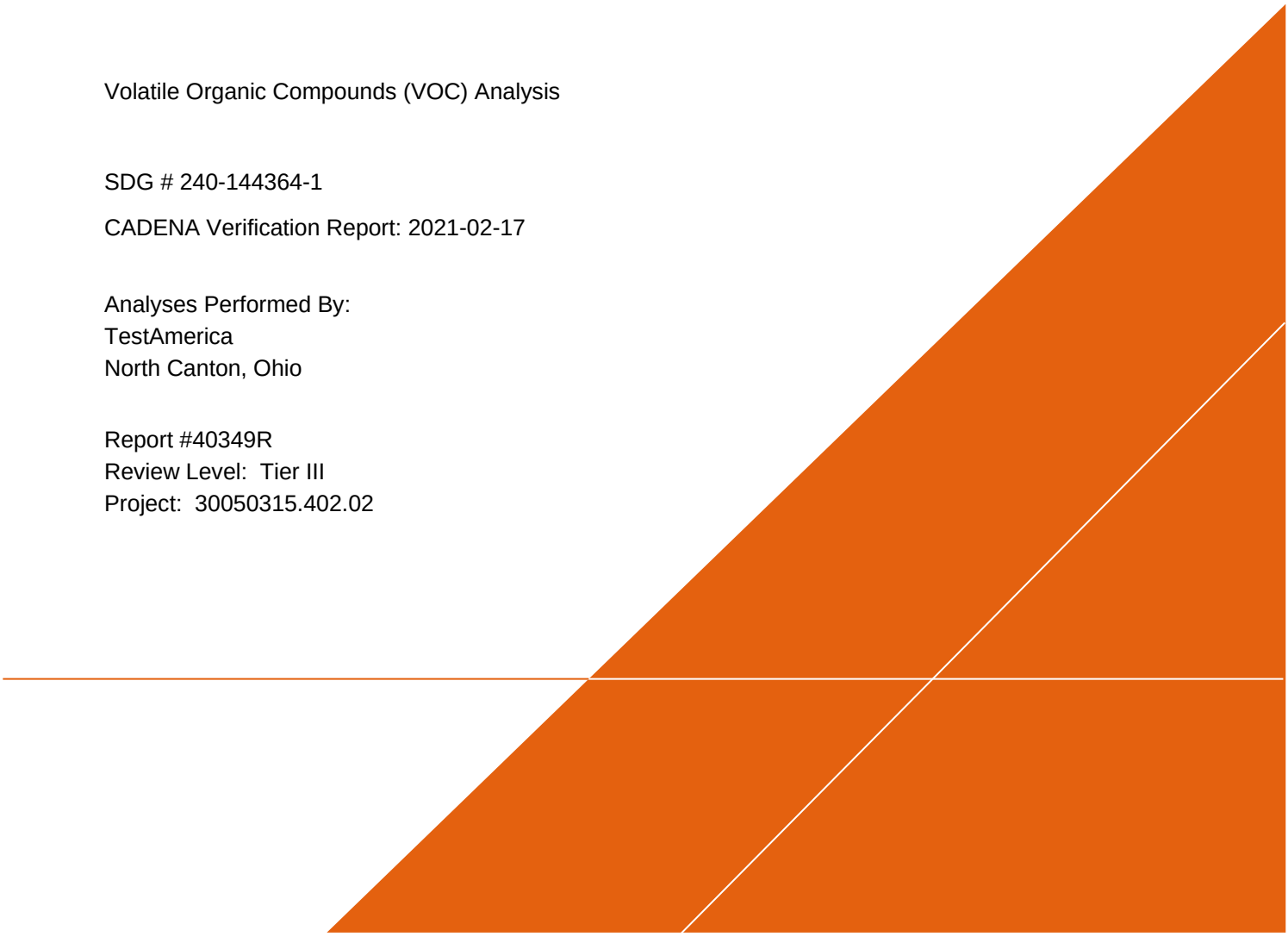
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144364-1

CADENA Verification Report: 2021-02-17

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report #40349R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144364-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis
					VOC
TRIP BLANK	240-144364-1	Water	02/09/2021		X
MW-192S_020921	240-144364-2	Water	02/09/2021		X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers

  U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

  B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

  J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

  UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

  J+ The result is an estimated quantity, but the result may be biased high.

  J- The result is an estimated quantity, but the result may be biased low.

  UB Analyte considered non-detect at the listed value due to associated blank contamination.

  N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.

  R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent

sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Holding times/Preservation		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD	X				X
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

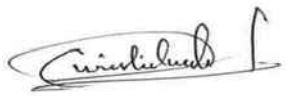
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: February 23, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 05, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS

Chain of Custody Record

MICHIGAN 190

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

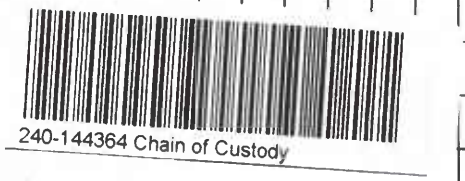
TestAmerica Laboratory location: Brighton — 10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses	For lab use only
City/State/Zip: Novi, MI, 48377	Sampler Name:	TAT if different from below: 10 day; ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client / Lab sampling
Phone: 248-994-2240	Method of Shipment/Carrier:			
Project Name: Ford LTP Off-Site	Shipping/Tracking No:			Job/SDG No:
Project Number: 30050315.402.04				
PO # 30050315.402.04				

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
TRIP BLANK				1						1					N	G	X	X	X	X	X	X	X	Trip Blank
MW-1925-020921	2/9/21	1525		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B 3 VOAs for 8260BSIM



Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

Submit all results through Cadena at jtomalia@cadenaco.com. Cadena #E203631
Level IV Reporting requested.

	Company:	Date/Time:		Company:	Date/Time:
Relinquished by:	Arcadis	2/9/21 1810	Received by: Novi cold storage	Arcadis	2/9/21 1810
Relinquished by:	Arcadis	2/10/2021	Received by:	ETA	2/10/21 1012
Relinquished by:	ETA	2/10/21 1307	Received in Laboratory by:	ETA	2-11-21 800

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02/17/2021

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-144364-1

Date Collected: 02/09/21 00:00
Matrix: Water
Date Received: 02/11/21 08:00

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 17:36	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/15/21 17:36	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 17:36	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 17:36	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 17:36	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 17:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*75 - 130*		*02/15/21 17:36*	*1*
4-Bromofluorobenzene (Surr)	*93*		*47 - 134*		*02/15/21 17:36*	*1*
Toluene-d8 (Surr)	*100*		*69 - 122*		*02/15/21 17:36*	*1*
Dibromofluoromethane (Surr)	*100*		*78 - 129*		*02/15/21 17:36*	*1*

Client Sample ID: MW-192S_020921
Lab Sample ID: 240-144364-2

Date Collected: 02/09/21 15:25
Matrix: Water
Date Received: 02/11/21 08:00

Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/12/21 17:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*		*02/12/21 17:57*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 17:58	1
cis-1,2-Dichloroethene	**0.20**	**J**	1.0	0.16	ug/L			02/15/21 17:58	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/15/21 17:58	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/15/21 17:58	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/15/21 17:58	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/15/21 17:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 130*		*02/15/21 17:58*	*1*
4-Bromofluorobenzene (Surr)	*90*		*47 - 134*		*02/15/21 17:58*	*1*
Toluene-d8 (Surr)	*99*		*69 - 122*		*02/15/21 17:58*	*1*
Dibromofluoromethane (Surr)	*101*		*78 - 129*		*02/15/21 17:58*	*1*